RCRA CLOSURE REPORT
FOUNDRY SAND DISPOSAL AREA

Hawkeye Castings
1077 South 3rd Street
Manchester, IA 52057
IAD 984599589
RCRA Docket VII 97 H 0008
8 May 2003

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for
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1.0 INTRODUCTION

Hawkeye Castings, Inc., also known as Tyrrell Investments, Inc., is located in the Manchester Industrial Park at 1077 South 3rd Street in Manchester, Iowa. The location can be further described as lying in the southwest 1/4 of Section 32, Township 89 North, Range 5 west of the Fifth Principal Meridian. The business has operated at this location since 1961, producing aluminum, brass, and bronze castings from sand molds. The U.S. Environmental Protection Agency (EPA) identification number for the facility is IAD984599589.

The location and vicinity of the facility are shown in Figure 1. As shown in Figure 2, the site consists of approximately six acres, with a single building housing both the foundry and office/administrative functions. It is bounded by Third Street on the east, the Illinois Central Railroad line to the west, a warehouse property to the north, and Henderson Manufacturing to the southeast. Across Third Street to the northeast are two residences.

It was established by the U.S. Environmental Protection Agency that some portion of foundry sand generated during day-to-day operation at Hawkeye Castings exceeded the maximum concentration for lead when tested by the toxicity characteristic leaching procedure (TCLP). Having met a characteristic of hazardous waste identified by EPA waste code D008, the material required transportation off-site to a permitted disposal facility. No permit had been applied for or issued for on-site disposal of hazardous waste at this site. Because of these circumstances, the site was subject to the closure requirements of 40 CFR Part 264.

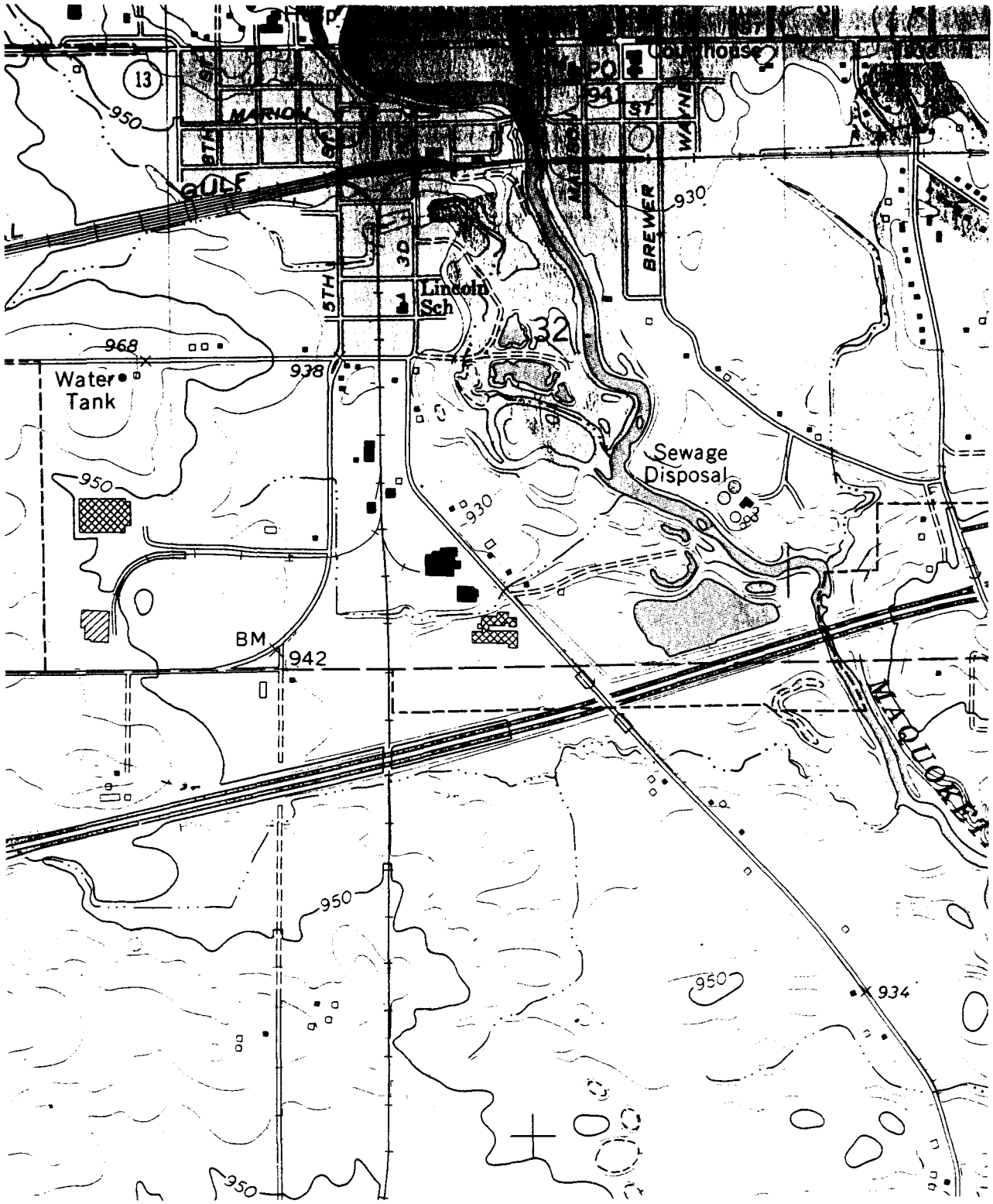


Figure 1
Site Location and Vicinity
1077 South 3rd Street
Manchester, Iowa

A Closure Plan was developed in accordance with 40 CFR Part 264 Subparts F and G for a land disposal unit at which foundry sand meeting the characteristic of hazardous waste had been placed. The text of these regulations is attached as Appendix A. The plan addressed steps to be taken to ensure that the area, when closed, would not present a significant risk to human health or the environment. The Closure Plan was submitted to EPA for review and was approved with some revisions, following a public comment period. As work progressed in accordance with the approved plan, results of investigation and sampling required amendments to the plan which were duly approved and implemented.

2.0 HAZARDOUS WASTE MANAGEMENT UNIT DESCRIPTION

2.1 Foundry Sand Disposal Area

Waste foundry sand is produced from normal metal casting operations. Sand is mixed with binding materials (phenolic resins) to form molds into which molten metal is poured. When the casting has cooled, the mold is broken to remove the casting and the sand is processed for recycling. Due to heat effects on the binding materials, a portion of the sand cannot be returned to a granular state suitable for re-use. This material is screened out as a waste stream and discarded.

At Hawkeye Castings, an area approximately 500 ft x 200 ft west of the plant may have received waste foundry sand over a period of 30 years (see Figure 2). The waste was first piled immediately west of the building and was periodically pushed westward. At a maximum, sand is present as a lift mixed with site soil and fill material of one foot over the original grade. The lift thins considerably as distance from the plant increases, and is undetected 500 feet west of the building. The maximum quantity of sand disposed was originally estimated at 2,200 cubic yards. A layer of silty clay 6-12 inches thick has been placed over the mix of foundry sand and soil, and overlain with topsoil. Vegetation at the site was observed to be healthy and robust throughout the closure process, consistent with the season.

Prior to promulgation of hazardous waste management regulations, the sand was not tested before disposal. In accordance with applicable regulations after 1980, testing by extraction procedure toxicity (EP Tox) methods indicated that some of the material disposed at the site exceeded the maximum limit for leachable lead. The quantity of sand meeting the characteristic of hazardous waste is not certain. The generation of hazardous waste in this process was a function of specific batch processes, including the timing and efficiency of mixing in the melt furnace and ladle. Leachable lead in the mold sand was an intermittent occurrence, not a continuous waste stream.

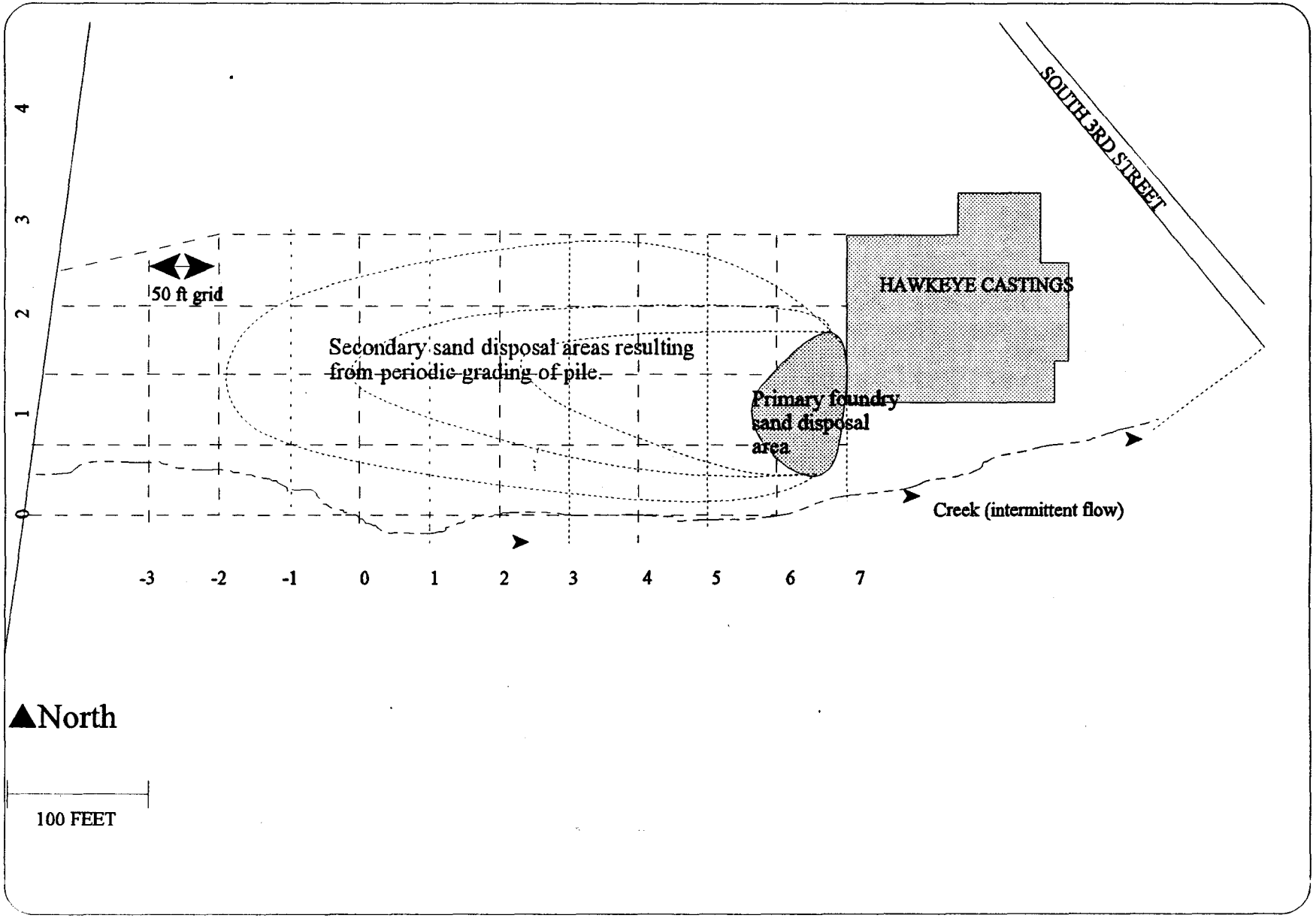


Figure 2
Foundry Sand Disposal Area

2.2 Preliminary Testing Results

A Phase II Environmental Assessment was carried out at Hawkeye Castings by Stanley Consultants in August 1996. A copy of their report is included as Appendix B. The assessment consisted of six borings through the sand/soil mixture into original grade. Three borings were completed at five feet and three were continued to a depth of 10 feet. Temporary monitoring wells were installed in the three deeper borings for collection of water samples. Surface water from an unnamed creek along the south boundary of the site was also collected. These sampling locations are shown on Figure 3.

A composite soil sample from all six borings was analyzed for total and leachable RCRA metals, as well as total and leachable copper, nickel, and zinc, and total phenols. These results are shown in Table 1. The leachability test conducted was the Toxic Characteristic Leaching Procedure, which replaced the EP Toxicity test in June 1990. Individual samples of sand from each boring were analyzed for total and leachable lead, as shown in Table 2. Field-filtered water samples were analyzed for dissolved RCRA metals along with copper, nickel, zinc, and total phenols. These analytical results are shown in Table 3.

Table 1
Analytical Results for Soil Composite from Six Borings

Phenols, mg/L	<0.020	Chromium, mg/L	<0.020	Nickel, mg/L	0.241
Arsenic, mg/kg	<16	Copper, mg/kg	4,400	Selenium, mg/kg	<30
Arsenic, mg/L	<0.08	Copper, mg/L	56	Selenium, mg/L	<0.15
Barium, mg/kg	9.5	Lead, mg/kg	600	Silver, mg/kg	<4
Barium, mg/L	0.464	Lead, mg/L	4.2	Silver, mg/L	<0.01
Cadmium, mg/kg	<4	Mercury, mg/kg	0.038	Zinc, mg/kg	1,100
Cadmium, mg/L	<0.020	Mercury, mg/L	<0.002		
Chromium, mg/kg	31	Nickel, mg/kg	360		

Quantities reported in mg/kg show total metals. Quantities reported in mg/L show leachable metals by TCLP.

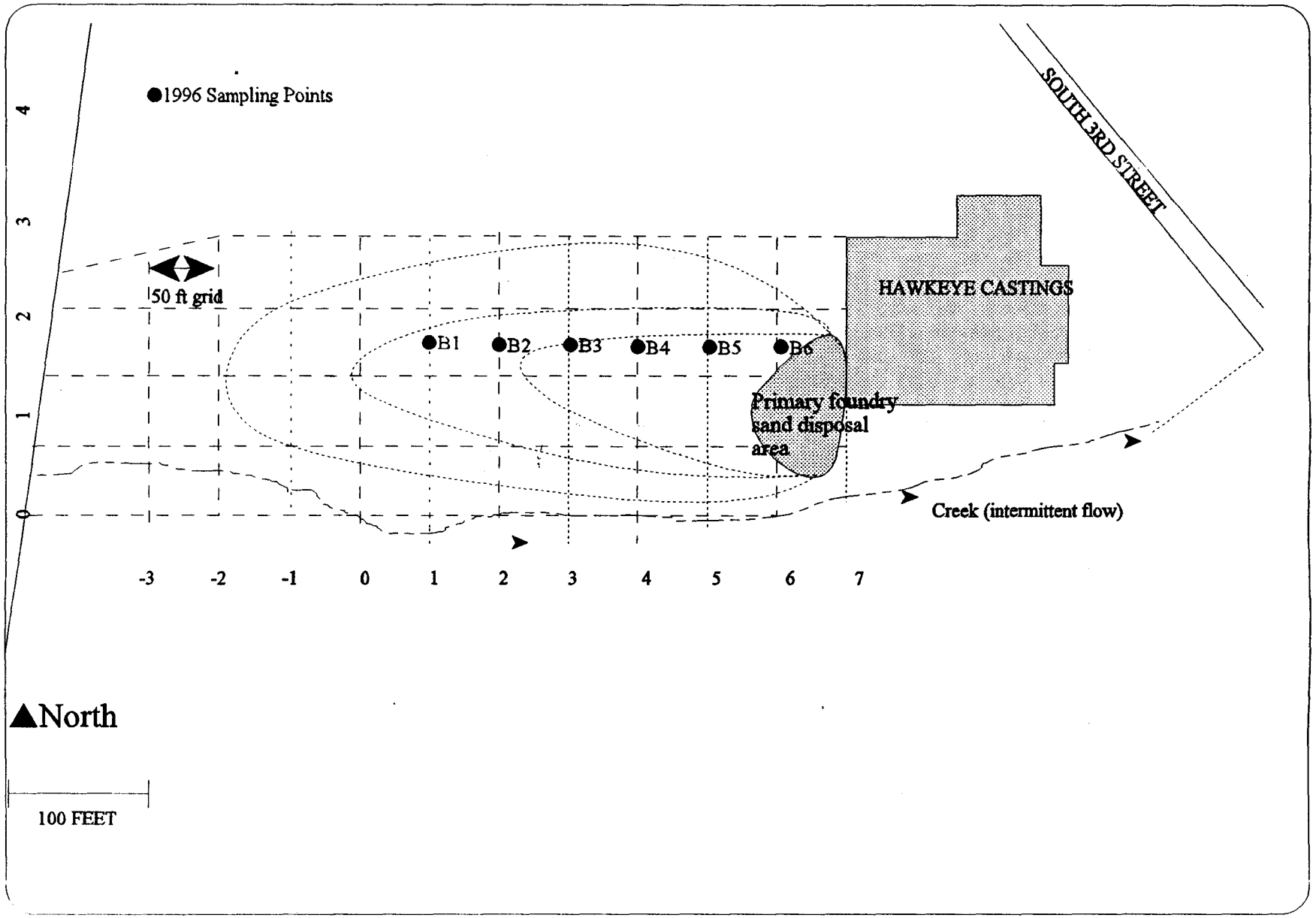


Figure 3
Phase II Sampling Locations (1996)

Table 2 Analytical Results for Six Individual Soil Samples						
Boring	**1**	**2**	**3**	**4**	**5**	**6**
Lead, total mg/kg	870	580	480	510	510	490
Lead, leachable, mg/L	0.54	**7.3***	**6.4***	**6.3***	**7.5***	3.2
*TCLP limit for lead = 5.0 mg/L is exceeded in these four samples. Depth of sampling was not recorded.						

Table 3 Analytical Results for Groundwater and Surface Water Samples				
Boring	**1**	**4**	**6**	**Unnamed Creek**
Phenols, mg/L	<0.020	<0.020	<0.020	<0.020
Arsenic, mg/L	<0.080	<0.080	<0.080	<0.080
Barium, mg/L	0.068	0.047	0.198	0.076
Cadmium, mg/L	<0.020	<0.020	<0.020	<0.020
Chromium, mg/L	<0.020	<0.020	<0.020	<0.020
Copper, mg/L	<0.020	<0.020	0.024	0.020
Lead, mg/L	<0.10	<0.10	<0.10	<0.10
Mercury, mg/L	<0.00020	<0.00020	<0.00020	<0.00020
Nickel, mg/L	<0.05	<0.05	<0.05	<0.05
Selenium, mg/L	<0.15	<0.15	<0.15	<0.15
Silver, mg/L	<0.010	<0.010	<0.010	<0.010
Zinc, mg/L	<0.020	0.030	<0.020	<0.020

As shown, soil samples from four of six borings were found to contain leachable lead above the TCLP maximum limit of 5.0 mg/L. Total lead concentration did not exceed 870 mg/kg in any sample. Groundwater and surface water did not contain positive detections of phenols or metals at concentrations above limits specified in 40 CFR 264.94(a)(2). However, for arsenic, cadmium, lead, and selenium, the analytical detection limit was higher than the limit specified in 40 CFR 264.94(a)(2), so it cannot be definitively stated that these metals were not present in the samples. It should be noted that the

investigation at that time was carried out as a Phase II environmental assessment to support a property transfer and was not subject to any particular standards or limits.

3.0 CLOSURE PERFORMANCE STANDARDS

It was intended that the closure of the foundry sand disposal area at Hawkeye Castings be certificd as clean, by demonstration that any hazardous constituents remaining on site do not pose a significant risk to human health or the environment. Representative sampling and analyses were carried out in accordance with the approved Closure Plan to verify that on-site concentrations of hazardous constituents arc at or below the regulatory or health-based standards shown in Table 4. The groundwater closure standards were set in accordance with 40 CFR Part 264.94(a). The standard for subsurface soil was set at 500 mg/kg. The standard for surface soil was set at 250 mg/kg. The standard for waste foundry sand was set at 5 mg/L (by TCLP). If the waste sand was found not to be a discrete layer but was mixed with soil, the applicable standard was to be the same as that set for subsurface soil.

Table 4
Closure Performance Standards

Constituent	Groundwater mg/L*	Subsurface soil mg/kg	Waste sand mg/kg	Surface soil mg/kg
lead	0.05	500	5 mg/L	250
arsenic	0.05	---	---	---
barium	1.0	---	---	---
cadmium	0.01	---	---	---
chromium	0.05	---	---	---
mercury	0.002	---	---	---
selenium	0.01	---	---	---
silver	0.05	---	---	---

*264.94(a)(2) [The concentration of a hazardous constituent] for any of the constituents listed in [the table] must not exceed the respective value given in that table if the background level of the constituent is below the value given, or 264.94(a)(3) Must not exceed an alternate limit established by the Regional Administrator under paragraph (b) of this section.
264.94(b) The Regional Administrator will establish an alternate concentration limit for a hazardous constituent if he finds that the constituent will not pose a substantial present or potential hazard to human health or the environment as long as the alternate concentration limit is not exceeded.

4.0 CLOSURE SAMPLING AND RESULTS - SOIL

In carrying out the approved Closure Plan, surface soil samples were collected at an interval from 0-6 inches of depth using a stainless steel or aluminum hand auger or a stainless steel spoon. The initial round of subsurface soil samples were collected using a truck-mounted drill rig to push a continuous sampler. Soil was easily removed from discrete intervals from the sample core collected by this method. Subsequent subsurface soil samples were collected from the floors and walls of excavated areas using an aluminum hand auger. All soil samples were placed in sealable plastic bags and labeled with the project number, sample identification, and date. Representative portions from each bag were transferred in the field into clean 4-ounce glass jars supplied by a laboratory, labeled, and placed in coolers with cold pack for transportation to the qualified laboratory. The remainder of each sample was sealed into the labeled plastic bag and stored in a temperature-controlled vault by *CHEM-ECO Environmental.*

Samplers wore disposable latex gloves, changing gloves after contact with each sample. Aluminum augers or stainless steel spoons were decontaminated with an alkaline phosphate-free detergent and rinsed with deionized, distilled water prior to the next use.

Work in accordance with the approved Closure Plan for Hawkeye Castings was initiated on 31 August 1999. A fifty-foot grid keyed to the northwest corner of the foundry building was measured and marked on the site. Samples were collected from twelve points on the grid, with an additional sampling point located west of the original investigation zone. As shown on Figure 4, surface soil samples were collected at five locations (samples S-1 through S-5). Each surface soil sample was analyzed for total lead.

At the other eight sampling locations, a soil core was collected by using a truck-mounted drill rig to push a continuous sampler with an acetate liner, each to a depth of 3-5 feet (samples S-6 through S-12 and S-14).

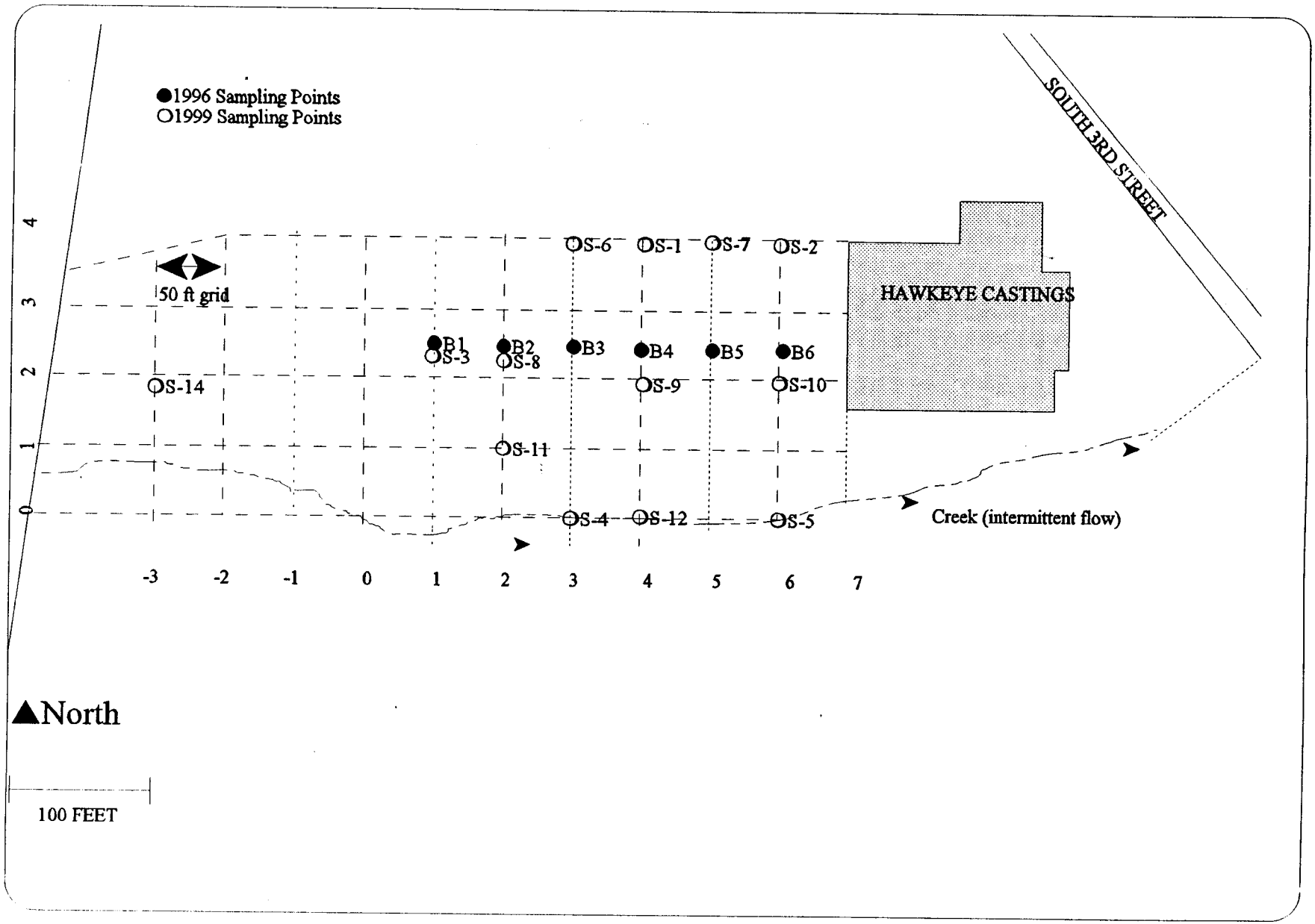


Figure 4
Closure Soil Sampling Locations (1999)

The soil cores were examined to determine if foundry sand was present, and if so, whether the sand occurred in a discrete layer or whether it was mixed with soil. There was only one of these eight locations at which a discrete layer of foundry sand was present (S-10). In this case, a sample of the sand was collected for lead analysis by TCLP. A sample of native soil underlying the sand at S-10 could not be collected. In four attempts, the native soil was not retained in the sampler. At five of the total eight sample points, the core showed soil mixed with foundry sand in varying amounts, underlain by native material. In each of these cases, a sample was collected from both the mixed and native layers and analyzed for total lead. At the remaining two of the eight sample points (S-12 and S-14), the core showed a layer of fill material with no foundry sand mixed in, overlying the native soil. Samples were collected from the fill material and native soil and analyzed for total lead. Surface and subsurface soil analytical results are shown in Table 5. Boring logs are attached as Appendix C.

From these results and from those from the Phase II investigation shown in Table 2, it was evident that the lead concentrations at a total of seven locations at the site exceeded the Closure Performance Standard s in the approved Closure Plan. An amendment to the plan was required to address excavation and proper disposal of soil from these locations, with the excavation zones centered at B-2, B-3, B-4, and B-5 (sampled during the Phase II investigation August 1996) and at sample points S-7, S-10, and S-11(sampled during the closure investigation August 1999). Confirmation sampling to verify complete removal of soil containing lead in excess of the performance standard at these seven locations was also included in the amended plan.

Table 5
Lead Concentrations in Soil and Foundry Sand

Sample	Location	Media	Lead mg/kg	Standard mg/kg
S-1	Grid point (4,4) surface soil 0-6 inches	soil	180	250
S-1D	Grid point (4,4) surface soil 0-6 inches	duplicate soil	110	250
S-2	Grid point (6,4) surface soil 0-6 inches	soil	110	250
S-3	Grid point (1, 2.5) surface soil 0-6 inches	soil	21	250
S-3	EPA split sample 248-2 surface soil 0-6 inches	split soil	21	250
S-4	Grid point (3,0) surface soil 0-6 inches	soil	34	250
S-5	Grid point (6,0) surface soil 0-6 inches	soil	51	250
S-6-1	Grid point (3,4) subsurface soil 11-17 inches	soil	330	500
S-6-2	Gridpoint (3,4) subsurface soil 17-24 inches	soil	12	500
S-7-1	**Grid point (5,4) subsurface soil 16-22 inches**	**soil**	**720**	**500**
S-7-2	Gridpoint (5,4) subsurface soil 22-28 inches	soil	<5	500
S-8-1	Grid point (2,2.5) subsurface soil 8-14 inches	soil	260	500
S-8-2	Grid point (2,2.5) subsurface soil 14-20 inches	soil	<5	500
S-8-2D	Grid point (2,2.5) subsurface soil 14-20.inches	duplicate soil	<5	500
S-9-1	Grid point (4,2) subsurface soil 7-13 inches	soil	240	500
S-9-2	Grid point (4,2) subsurface soil 13-19 inches	soil	5.6	500
S-10-1	**Grid point (6,2) subsurface sand 6-18 inches**	**foundry sand**	**18 mg/L**	**5 mg/L**
S-10-1	**EPA split sample 248-4 subsurface sand**	**split sand**	**14.2 mg/L**	**5 mg/L**
S-10-1	EPA split sample 248-3 subsurface sand	split sand	85.3	500
S-11-1	**Grid point (2,1) subsurface soil 12-18 inches**	**soil**	**900**	**500**
S-11-2	Grid point (2,1) subsurface soil 18-24 inches	soil	6.8	500
S-12-1	Grid point (4,0) subsurface soil 17-23 inches	soil	5.9	500
S-12-2	Grid point (4,0) subsurface soil 24-30 inches	soil	<5.0	500
S-14-1	Grid point (-3, 1.8) subsurface soil 18-24 inches	soil	7.5	500
S-14-2	Gridpoint (-3, 1.8) subsurface soil 24-30 inches	soil	<5.0	500

As illustrated in Figure 5, it was originally proposed that soil would be manually excavated in a radial zone around each of the sample points to the depth of the native soil (approximately 24 inches) and a diameter of 18 inches, except at S-10, where the diameter was expanded to 36 inches to encompass the area disturbed by multiple push-sampling attempts. Soil from each radial excavation was to be placed in plastic containers and managed for disposal as hazardous waste. Confirming samples were to be collected from three points of an equilateral triangle from the walls of the excavation at the same depth interval that the original sample had been collected, and from the excavation floor. In order to carry out this procedure at B-2, B-3, B-4, and B-5, it was necessary to locate the sample points, which reportedly were plugged with bentonite.

On 25 October 1999, the reported locations of B-2, B-3, B-4 and B-5 were measured onto the site grid and each location was probed manually for the presence of the bentonite plugs. Although the area of investigation was expanded to account for imprecision in the original measurements, no bentonite was discovered at any of the expected points. On 30 November 1999, a skid loader was brought on site and used to peel back the fill material over the native soil in an area 12 feet by 10 feet centered on the expected position of the borehole at B-2, but no bentonite was found. At B-3, an area 18 feet by 10 feet was uncovered, again without locating the borehole. The disturbed soil at B-2 and B-3 was replaced with the loader and no further attempt was made to find the original boreholes at either of these locations or at B-4 and B-5. Instead, the disturbed areas at B-2 and B-3 were delineated as excavation zones and areas 10 feet by 10 feet were delineated around B-4 and B-5 for excavation. In this

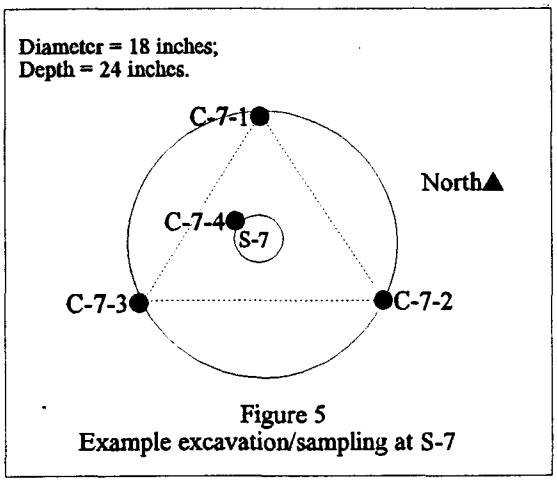


Figure 5
Example excavation/sampling at S-7

manner, although the exact point originally sampled could not be located, it was asserted that the areas to be excavated were of sufficient extent to account for any imprecision of measurement as recorded in the August 1996 Phase II report and that the boreholes were located within the delineated excavation zones.

Because of the larger areas then to be excavated at B-2, B-3, B-4, and B-5, compared to the previously proposed radial zones with 18 inch diameters, it was necessary to consider an alternate form of storage for the excavated material while the samples confirming that removal was complete were being analyzed. Accordingly, the Closure Plan was again amended to allow the construction of staging piles next to the excavations at S-10, B-2, B-3, B-4, and B-5. The smaller volumes of soil to be removed at S-7 and S-11 would still be stored in plastic containers as originally planned. In addition, because of the increased volume from the larger excavations, it was no longer considered economical to dispose of the soil as hazardous waste (as had been originally planned) without further analysis to confirm the chemical characteristics of the soil. Instead, it was proposed to collect composite samples during the excavation of each sample point, with analysis by TCLP for RCRA metals to determine proper disposal.

On 5 May 2000, the radial excavations of soil at S-7 and S-11 were carried out. As discussed previously, a soil core had been collected at the location identified as S-7 on 31 August 1999. As discussed above, a sample of mixed sand and soil (S-7-1) analyzed for total lead was shown to have exceeded the closure performance standard of 500 mg/kg. Accordingly, soil was excavated from a circular area with a diameter of 18 inches to a depth and appearance that was correlative with original grade. Confirming samples were collected from the floor and walls of this excavation. All confirming samples were shown to contain lead below the Closure Performance Standard. The confirming sample with the highest total lead concentration (C-7-4) was then analyzed by TCLP and shown not to exceed the maximum leachable lead level for this characteristic test. A composite sample of the excavated soil was also analyzed by TCLP and shown not to

exhibit the RCRA characteristic of toxicity for eight heavy metals. These analytical results are shown in Table 6.

Table 6
Sample Location S-7 - Lead Concentrations Before and After Excavation

Sample	Date	Description	Media	Lead mg/kg	Standard mg/kg
S-7-1	**8/31/99**	**Subsurface soil 16-22 inches**	**soil**	**720**	**500**
C-7-1	5/3/00	S-7 confirming sample (wall)	soil	56	500
C-7-1D	5/3/00	S-7 confirming sample dupl. (wall)	soil	59	500
C-7-2	5/3/00	S-7 confirming sample (wall)	soil	92	500
C-7-3	5/3/00	S-7 confirming sample (wall)	soil	61	500
C-7-4	5/3/00	S-7 confirming sample (floor)	soil	210	500
C-7-4	5/3/00	S-7 confirming sample (floor)	soil	<0.10 mg/L	5 mg/L
S-7-3	5/3/00	Composite of excavated soil	composite	1 mg/L	5 mg/L

As discussed previously, a soil core was collected at the location identified as S-11 on 31 August 1999. A sample of mixed sand and soil (S-11-1) from that location was analyzed for total lead and shown to exceed the closure performance standard of 500 mg/kg. Accordingly, as described previously for location S-7, soil was excavated from an area with a diameter of 18 inches and depth to original grade. Confirming samples were collected from the floor and walls of the excavation. All confirming samples were shown to contain lead below the standard. However, when the confirming sample with the highest total lead concentration (C-11-3) was analyzed by TCLP, it was shown that the RCRA limit for leachable lead (5 mg/L) was exceeded. In accordance with the amended Closure Plan, additional excavation with confirming samples from the wall and floor of the extended excavation were required at the location of sample C-11-3. This work is discussed later in this report. A composite sample of soil from the excavation was also analyzed by TCLP and shown not to exhibit the RCRA characteristic of toxicity for heavy metals. The analytical

results from the initial sampling and confirmation sampling after the first excavation are shown in Table 7.

Table 7
Sample Location S-11 - Lead Concentrations

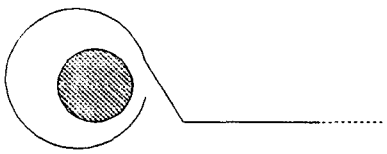
Sample	Date	Description	Media	Lead mg/kg	Standard mg/kg
S-11-1	**8/31/99**	**Subsurface soil 12-18 inches**	**soil**	**900**	**500**
C-11-1	5/3/00	S-11 confirming sample (wall)	soil	110	500
C-11-2	5/3/00	S-11 confirming sample (wall)	soil	380	500
C-11-3	5/3/00	S-11 confirming sample (wall)	soil	420	500
C-11-3	**5/3/00**	**S-11 confirming sample (wall)**	**soil**	**5.5 mg/L**	**5 mg/L**
C-11-4	5/3/00	S-11 confirming sample (floor)	soil	10	500
S-11-3	5/3/00	Composite of excavated soil	composite	4.3 mg/L	5 mg/L

On 16 October 2000, staging pile liners were constructed next to the planned excavations zones at B-2, B-3, B-4, B-5, and S-10. The liners were comprised of rectangles of 20-mil gauge polymer, of sufficient thickness to avoid puncture and of sufficient durability to withstand exposure to sun and weather. Six-inch diameter heavy corrugated cardboard cylinders were secured into the edges of the liner to create a berm on all four sides.

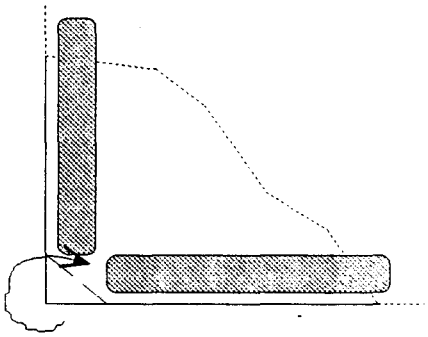
On 17 October 2000, soil from the five delineated zones was excavated using a backhoe. Confirming samples from the walls and floor of each excavation were collected as well as composite samples of the excavated soil. The excavated soil was placed on the polymer liner at each location and covers were constructed over the soil to prevent infiltration by precipitation. The covers consisted of a second rectangular sheet of 20-mil polymer, with the edges clamped between wooden slats and pegged underneath the outsides of the bermed bottom liner. Concrete weights were then placed on top of the covers to further secure them from wind damage. Figure 6 illustrates the installation.

To clarify, the excavated material was separated from the soil beneath the liner and was protected from precipitation by the cover. Run-off from the cover was directed to the outside of the bermed liner and could not collect inside the berm. Due to this construction, the covered material was not subject to erosion by wind or water. This design prevented the release of potentially hazardous waste or hazardous constituents from the staging piles to the environment. Cross-media transfer was also controlled by this design.

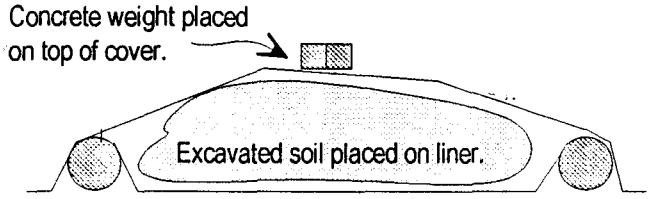
As described previously, a sample core was collected at the location identified as S-10 on 31 August 1999. Some difficulty was encountered in pushing the sampler, and original grade was not reached in several attempts. A sample of foundry sand (S-10-1) was split with the representative of EPA from USGS and analyzed for leachable lead TCLP. Both analytical reports for the split sample showed the closure performance standard of 5 mg/L was exceeded. Accordingly, soil was excavated from a circular area with diameter 3 feet and depth to original grade. The diameter was expanded from 18 inches to 3 feet in this case in order to encompass the entire area disturbed by the multiple push sampling. During excavation, metallic objects (wire, drum-seal rings, etc.) associated with foundry operations were found and determined to be the likely cause of auger refusal during the original sampling effort. Confirming samples were collected from the floor and walls of the excavation. All confirming samples were shown to contain lead below the applicable closure performance standard. The confirming sample with the highest total lead concentration (C-10-2) was then analyzed by atomic absorption spectroscopy and inductively-coupled plasma methods to demonstrate that these two laboratory instruments (AA and ICP) provided comparable results. C-10-2 was also further analyzed by TCLP, with the result that leachable lead was found to be below 5 mg/L. A composite sample of soil collected during the excavation was also analyzed by TCLP and shown not to exhibit the characteristic of toxicity for heavy metals. These analytical results are shown in Table 8.



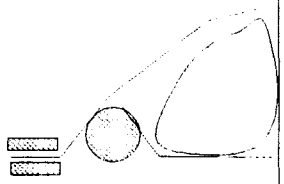
Detail liner wrap around cylinder curbs. Liner is secured to roller with adhesive, then rolled under 360 degrees.



Detail corner between cylinder curbs. Corner is lapped upward and secured with adhesive.



Detail cover over excavated soil placed inside curbs on liner. Cover edges are placed outside the curbs so precipitation will not enter covered area.



Detail cover edge. Edge is secured outside curb by clamping between flat wood strips.

Figure 6 Example of staging pile liner and cover construction

Table 8 Sample Location S-10 - Lead Concentrations					
Sample	**Date**	**Description**	**Media**	**Lead mg/kg**	**Standard mg/kg**
S-10-1	**8/31/99**	**Subsurface sand 6-18 inches**	**foundry sand**	**18 mg/L**	**5 mg/L**
S-10-1	**8/31/99**	**Subsurface sand 6-18 inches**	**EPA split sand**	**14.2 mg/L**	**5 mg/L**
C-10-1	10/17/00	Excavation wall 24-36 inches	soil	19	500
C-10-1-D	10/17/00	Excavation wall 24-26 inches	duplicate soil	16	500
C-10-2	10/17/00	Excavation wall 29-35 inches	soil	190	500
C-10-2	10/17/00	Excavation wall 29-35 inches	soil	54 (AA)	500
C-10-2	10/17/00	Excavation wall 29-35 inches	soil	50 (ICP)	500
EPA-880-3	10/17/00	Split sample of C-10-2	split soil	44.7 (ICP)	500
C-10-2	10/17/00	Excavation wall 29-35 inches	soil	0.30 mg/L	5 mg/L
EPA-880-3	10/17/00	Excavation wall 29-35 inches	split soil	0.09 mg/L	5 mg/L
C-10-3	10/17/00	Excavation wall 22-30 inches	soil	91	500
C-10-4	10/17/00	Excavation wall 25-31 inches	soil	38	500
C-10-5	10/17/00	Excavation floor 33-38 inches	soil	160	500
S-10-3	10/17/00	Composite excavated soil	soil	4.4 mg/L	5 mg/L

As discussed previously, a sample core was collected at the location identified as B-2 in 1996. A sample of mixed sand and soil (B-2) was analyzed at that time and shown to exceed the TCLP maximum lead level of 5 mg/L. Because the exact position of original borehole could not be located, soil was excavated from an area 12 feet x 18 feet and depth to original grade, centered on the reported original sampling location. Confirming samples were collected from the floor and walls of the excavation as illustrated in Figure 7. All confirming samples except B-2-4 on the west wall of the excavation were shown to contain lead below the closure performance standard of 500 mg/kg. Additional excavation was required at the location of B-2-4 with confirming samples collected from the walls and floor of the extended excavation. This work will be

discussed later in this report. Of the other confirming samples, the one with the next highest lead concentration is B-2-3/B-2-3D. This sample was further analyzed by TCLP to show that leachable lead does not exceed 5 mg/L. A composite sample of soil collected during the excavation was also analyzed by TCLP and shown not to exhibit the RCRA characteristic of toxicity for heavy metals. These analytical results are shown in Table 9.

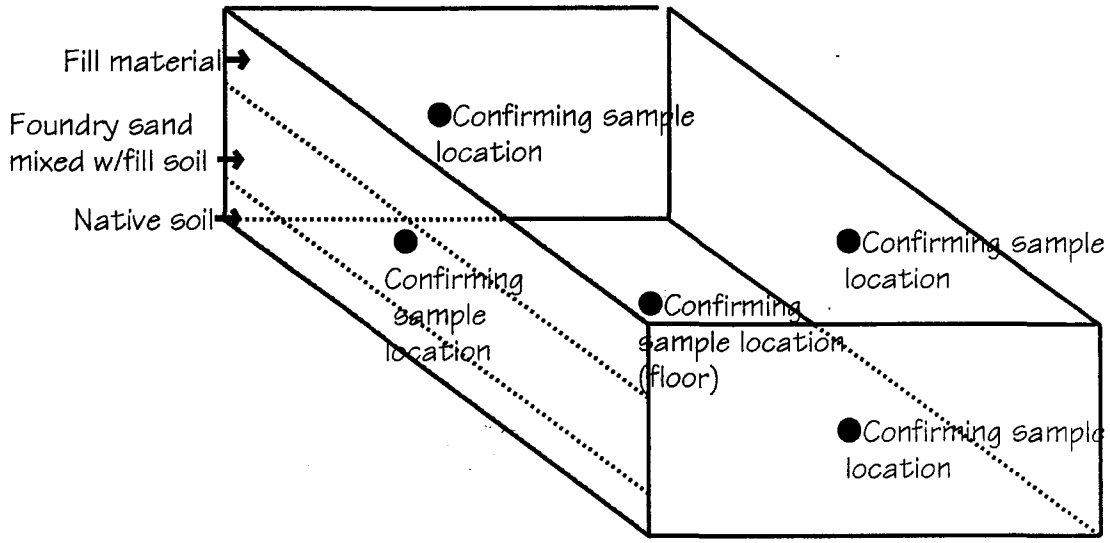


Figure 7 Example Excavation and Confirmation Sampling

Table 9 Sample Location B-2 - Lead Concentrations					
Sample	**Date**	**Description**	**Media**	**Lead mg/kg**	**Standard mg/kg**
B-2	**1996**	**Subsurface soil**	**soil**	**7.3 mg/L**	**5 mg/L**
B-2-1	10/17/00	Excavation wall 13-19 inches	soil	170	500
B-2-2	10/17/00	Excavation wall 10-15 inches	soil	61	500
B-2-3	10/17/00	Excavation wall 13-18 inches	soil	220	500
B-2-3-D	10/17/00	Excavation wall 13-18 inches	duplicate soil	420	500
B-2-3	10/17/00	Excavation wall 13-18 inches	soil	1.38 mg/L	5 mg/L
B-2-4	**10/17/00**	**Excavation wall 14-19 inches**	**soil**	**540**	**500**
B-2-5	10/17/00	Excavation floor 18-20 inches	soil	220	500
B-2-6	10/17/00	Excavation floor 18-20 inches	soil	51	500
B-2-7	10/17/00	Excavated soil composite	soil	4.3 mg/L	5 mg/L

As described previously, a sample core was collected at the location identified as B-3 in 1996. A sample of mixed sand and soil (B-3) was analyzed at that time and shown to exceed the TCLP maximum lead level of 5 mg/L. Since the position of the borehole could not be confirmed, soil was excavated from an area 12 feet by 10 feet and depth to original grade, representative of the reported original sampling location. Confirming samples were collected from the floor and walls of the excavation. All confirming samples were shown to contain lead below the closure performance standard of 500 mg/kg. The confirming sample with the highest lead total lead concentration (B-3-3) was analyzed by TCLP and shown not to exceed the standard of 5 mg/L. A composite sample of soil from the excavation was also analyzed by TCLP and shown not to exhibit the RCRA characteristic of toxicity for heavy metals. These analytical results are shown in Table 10.

Table 10 Sample Location B-3 - Lead Concentrations					
Sample	**Date**	**Description**	**Media**	**Lead mg/kg**	**Standard mg/kg**
B-3	**1996**	**Subsurface soil**	**soil**	**6.4 mg/L**	**5 mg/L**
B-3-1	10/17/00	Excavation wall 15-21 inches	soil	12	500
B-3-2	10/17/00	Excavation wall 13-19 inches	soil	15	500
B-3-3	10/17/00	Excavation wall 9-13 inches	soil	390	500
B-3-3	10/17/00	Excavation wall 9-13 inches	soil	0.18 mg/L	5 mg/L
B-3-4	10/17/00	Excavation wall 14-20 inches	soil	56	500
B-3-5	10/17/00	Excavation floor 18-22 inches	soil	<5.0	500
B-3-6	10/17/00	Excavation floor 14-20 inches	soil	6.2	500
B-3-6D	10/17/00	Excavation floor 14-20 inches	duplicate soil	<5.0	500
B-3-7	10/17/00	Excavated soil composite	soil	1.3	5 mg/L

As discussed previously, a sample core was collected at the location identified as B-4 in 1996. A sample of mixed sand and soil (B-4) was analyzed at that time and shown to exceed the TCLP maximum lead level of 5 mg/L. Accordingly, soil was excavated from an area 10 feet by 10 feet and depth to original grade, representative of the original sampling location. Confirming samples were collected from the floor and walls of the excavation. All confirming samples were shown to contain lead below the closure performance standard of 500 mg/kg. The confirming sample with the highest total lead concentration (B-4-3) was analyzed by TCLP and shown not to exceed the maximum leachable lead limit of 5.0 mg/L. A composite sample of soil from the excavation was also analyzed by TCLP and shown not to exhibit the RCRA characteristic of toxicity for heavy metals. These analytical results are shown in Table 11.

Table 11 Sample Location B-4 - Lead Concentrations					
Sample	**Date**	**Description**	**Media**	**Lead mg/kg**	**Standard mg/kg**
B-4	**1996**	**Subsurface soil**	**soil**	**6.3 mg/L**	**5 mg/L**
B-4-1	10/17/00	Excavation wall 18-24 inches	soil	5.9	500
B-4-2	10/17/00	Excavation wall 16-23 inches	soil	11	500
B-4-3	10/17/00	Excavation wall 19-26 inches	soil	45	500
B-4-3	10/17/00	Excavation wall 19-26 inches	soil	<0.10 mg/L	5 mg/L
B-4-4	10/17/00	Excavation wall 20-25 inches	soil	20	500
B-4-5	10/17/00	Excavation floor 22-27 inches	soil	<5.0	500
B-4-6	10/17/00	Excavated soil composite	soil	2.0 mg/L	5 mg/L

As described previously, a sample core was collected at this location in 1996. A sample of mixed sand and soil (B-5) was analyzed and shown to exceed the TCLP maximum lead level of 5 mg/L. Accordingly, soil was excavated from an area 10 feet by 10 feet and depth to original grade, representative of the original sampling location. Confirming samples were collected from the floor and walls of the excavation. All confirming samples were shown to contain lead below the closure performance standard of 500 mg/kg. The confirming sample with the highest lead total lead concentration (B-5-4) was not submitted for further analysis by TCLP. The total lead in this sample was 7.6 mg/kg and it was accepted that samples with much higher lead concentrations had already been shown not to exceed the RCRA maximum leachable lead limit of 5.0 mg/L. A composite sample of soil from the excavation was also analyzed by TCLP and shown not to exhibit the RCRA characteristic of toxicity for heavy metals. These analytical results are shown in Table 12.

Table 12 Sample Location B-5 - Lead Concentrations					
Sample	**Date**	**Description**	**Media**	**Lead mg/kg**	**Standard mg/kg**
B-5	**1996**	**Subsurface soil**	**soil**	**7.5 mg/L**	**5 mg/L**
B-5-1	10/17/00	Excavation wall 16-23 inches	soil	5.5	500
B-5-2	10/17/00	Excavation wall 19-25 inches	soil	<5.0	500
B-5-3	10/17/00	Excavation wall 13-18 inches	soil	6.4	500
B-5-4	10/17/00	Excavation wall 14-20 inches	soil	7.6	500
B-5-5	10/17/00	Excavation floor 18-25 inches	soil	<5.0	500
B-5-6	10/17/00	Excavated soil composite	soil	1.4 mg/L	5 mg/L

Based on the composite soil analyses from each of the seven excavation zones, it was determined that the soil contained in the staging piles and in two plastic containers from the smaller excavations did not require disposal as hazardous waste. An application was made to the Iowa Department of Natural Resources (IDNR) to approve the soil for disposal as a "special waste." IDNR reviewed information included in the application and concluded that no special waste authorization was required. Arrangements were made for acceptance of the soil for disposal at a licensed landfill located near Delhi, Iowa.

On 29 November 2000, the excavated soil was removed from the five staging piles with a backhoe. The covers, liners, corrugated tubes, and wooden slats used to construct the staging piles were transported by truck along with the soil for disposal at the Sands Landfill near Delhi, Iowa. Soil staged in two plastic containers at S-7 and S-10 was also disposed at that landfill at the time. Two areas at which confirming samples showed the needed for additional soil removal (C-11-3 and B-2-4) were excavated at that time, with the soil placed into the plastic containers previously used at S-7 and S-10. Due to weather conditions, confirming samples from the floors and walls of the extended excavations and confirming samples from the

areas on which the staging pile liners had been placed were delayed. Labeled wooden stakes were inserted to mark the sampling points until sample collection could be carried out, which occurred on 26 April 2001.

At each of the two extended excavations, confirming samples were taken from the three walls and the floor and analyzed for total lead. Composite samples of the excavated soil from each location were analyzed for RCRA metals by TCLP. As shown in Table 13, none of the confirming samples contained lead at concentrations exceeding the Closure Performance Standard. At B-2-4, total lead in the confirming samples did not exceed the concentration at B-2-3 (the sample further tested by TCLP), so no additional testing was required to complete the work at that location. At C-11-3, total lead in the confirming samples did not exceed the concentration at C-11-2 (the sample further tested by TCLP), so no additional testing was required to complete the work at that location. The composite samples of excavated soil did not exhibit any RCRA characteristic of metal toxicity. The soil was subsequently transported for disposal to the Sands Landfill, near Delhi, Iowa as had been done previously.

Surface soil samples were collected from each area on which a staging pile had been constructed. The purpose of this sampling was to demonstrate that the use of staging piles did not result in release of lead in excess of Closure Performance Standards to the soil under the liners. The standard was not exceeded in any of these samples, as shown in Table 14.

On 19 December 2002, a composite sample of fill soil was collected from a storage pile owned by Krogman Construction in Manchester, Iowa. The sample was analyzed by TCLP for eight RCRA metals and was shown not to contain heavy metals above the TCLP maximum concentrations (see Table 15). On 16 January 2003, the excavations were backfilled with soil from the pile tested. Due to weather and site conditions, final grading was not completed until May 2003.

Table 13
Confirming Samples Locations B-2 and S-11 Lead Concentrations

Sample	Date	Description	Media	Lead mg/kg	Standard mg/kg
B-2-4-1	4/26/01	north wall of excavation at B-2-4	soil	31	500
B-2-4-2	4/26/01	south wall of excavation at B-2-4	soil	65	500
B-2-4-3	4/26/01	west wall of excavation at B-2-4	soil	57	500
B-2-4-4	4/26/01	floor of excavation at B-2-4	soil	41	500
B-2-4-4D	4/26/01	floor of excavation at B-2-4	duplicate	63	500
B-2-4	4/26/01	composite of excavated soil	soil	3.09 mg/L	5 mg/L
Sample	**Date**	**Description**	**Media**	**Lead mg/kg**	**Standard mg/kg**
C-11-3-1	4/26/01	north wall of excavation at C-11-3	soil	68	500
C-11-3-2	4/26/01	south wall of excavation at C-11-3	soil	240	500
C-11-3-3	4/26/01	west wall of excavation at C-11-3	soil	270	500
C-11-3-4	4/26/01	floor of excavation at C-11-3	soil	240	500
C-11-4	4/26/01	composite of excavated soil	soil	0.25 mg/L	5 mg/L

Table 14
Lead Concentrations in Liner Confirming Samples (surface soil) (mg/kg

Analyte	B-2-L-1 4/26/01	B-2-L-2 4/26/01	B-3-L-1 4/26/01	B-3-L-2 4/26/01	B-4-L-1 4/26/01	B-5-L-1 4/26/01	B-5-L-1D 4/26/01	S-10-L-1 4/26/01	Standard
Lead	34	22	15	15	25	19	19	15	250

Table 15
Fill Soil Composite - TCLP Metals Concentrations (mg/L)

	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver
Concentration	<0.015	0.189	<0.020	<0.020	<0.10	<0.0020	<0.15	<0.020
Standard	5.0	100	1.0	5.0	5.0	0.2	1.0	5.0

5.0 Closure Sampling and Results - Groundwater

The results from 1996 sampling of groundwater and surface water at this site shown in Table 3 indicate that although material meeting the characteristic of hazardous waste for leachable lead had been disposed on-site, perhaps over many years, the groundwater underlying the site and surface water in a drainage creek along the south edge of the site had not been contaminated. The water table is typically shallow in this area (encountered from 4-7 feet of depth when sampling was carried out in 1996). Due to the long-term placement of waste over this area and the relatively high water table, it was expected that if heavy metals contained in the waste foundry sand represented a significant risk of contamination to the groundwater, migration would have occurred and would be evident. The approved Closure Plan included placement of four temporary monitoring wells to confirm whether the preliminary sampling results were representative of the entire site.

The wells were installed on 1 September 1999, using a drill rig with hollow-stem auger to bore to a depth five feet below the encountered water table. The well locations are shown on Figure 8. The locations of TMW-1, TMW-2, TMW-3, and TMW-4 coincide with the subsurface sampling points S-7, S-9, S-10, and S-12. The groundwater flow direction was triangulated as shown on Figure 8. Boring logs and well construction diagrams are attached as Appendix C.

The temporary wells were constructed of 2-inch diameter PVC casing screwed to 2-inch diameter factory-fabricated PVC screen with 0.010 inch slots, with the screen extending five feet below and two feet above the static water level encountered during borehole advancement. Both screens and casings were steam-cleaned prior to installation. A clean sand filter pack (Northern Gravel Coarse 0) was placed in the borehole annulus to a depth approximately one foot above the top of the screen to reduce infiltration of fines into the screened area. Bentonite was used to seal around the casing from the top of the sand pack to

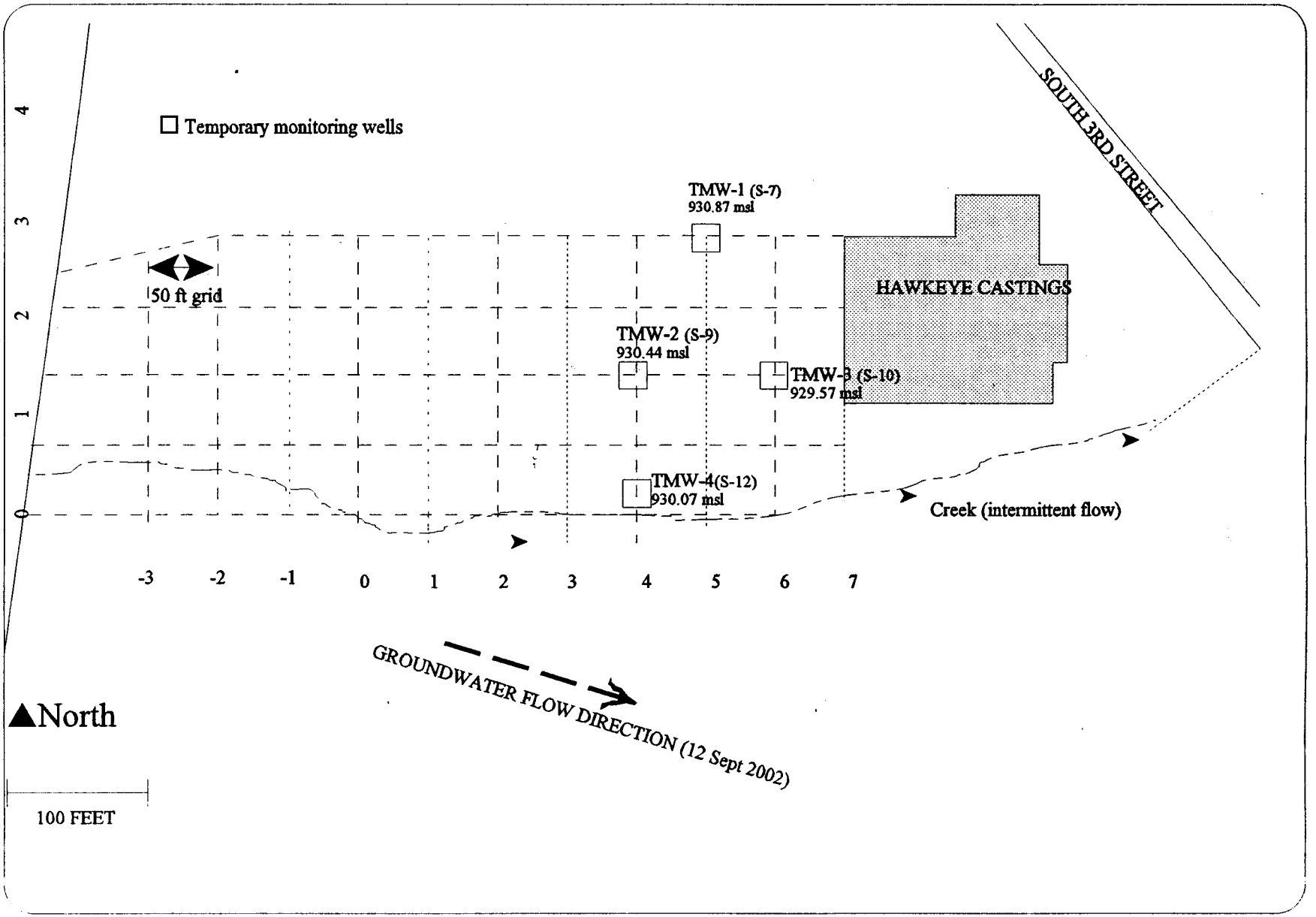


Figure 8
Monitoring Well Locations and Groundwater Flow Direction

the soil surface. Each casing was labeled with the well number and fitted with a locking well cap.

Wells were developed by manual bailing using disposable polyethylene bailers, one for each well. Temperature, pH, and specific conductivity of the water were recorded as the wells were developed until the parameters had stabilized to within 10% variation over three consecutive readings. Approximately three well volumes were removed from each well. The development water was contained in a plastic drum on site. A control survey was carried out to provide information to calculate groundwater flow direction.

Prior to initial sampling, total well depth and static water levels were measured from top of casing and the wells were slowly purged of at least three well volumes by manual bailing using disposable polyethylene bailers. Purging was continued until temperature, pH, and specific conductivity of the water stabilized to within 10% variability over three consecutive readings. On 3 May 2000, samples were collected in the bailers immediately after purging, and placed into plastic quart containers treated with nitric acid for sample preservation. Each sample was labeled, dated, and preserved in a cooler at 4°C for transport to the EPA-approved laboratory. Samples were analyzed for eight RCRA metals. Analytical reports are attached within Appendices E through M for each sampling event. Purge water from the wells was contained in a labeled plastic drum on site. As shown in Table 16, several samples showed concentrations of metals of concern above the Closure Performance Standards. In some cases, laboratory method detection limits for the analysis were not set low enough to demonstrate compliance with the standards. Although the wells had been developed and then purged prior to sampling, the turbidity of the samples due to suspended fine particles remained high and was asserted to be contributing to the exceedences of the performance standards. A second round of sampling was carried out on 21 February 2001, with similar results.

To reduce turbidity generated by manual bailing, the use of a low-flow peristaltic pump (GeoPump No. 1, SN 71233, 350 rpm) was approved by EPA, for a third round of sampling carried out 26 April 2001. Drawdown ranged from 0.11 feet in TMW-4 to 0.59 feet in TMW-2 during sample collection. Turbidity was markedly reduced in collected samples with a corresponding drop in measured concentrations of all metals of concern. Three more rounds of sampling using the peristaltic pump were carried out to verify that metals were not found in the groundwater at concentrations exceeding the Closure Performance Standards. These occurred on 29 November 2001, 30 April 2002, and 12 September 2002. For the final three rounds, and with EPA approval, the analytes were reduced from eight RCRA metals to arsenic, cadmium, chromium, and lead. Turbidity was also measured in each sample.

Analytical results of groundwater sampling are shown in Tables 16, 17, 18, and 19. Measured physical parameters of the sampling events are shown in Table 20.

On 26 November 2002, the well casings and screens were removed and the boreholes were plugged with bentonite clay. Well abandonment forms are included in Appendix C.

Water from development of the wells and from purging before sampling was collected in a 55-gallon drum at the site. A sample of the accumulated water collected on 26 April 2001 had an undetectable concentration of lead. A sample collected 19 December 2002 was tested for eight RCRA metals. All concentrations were shown to be below TCLP maximum concentrations. On 13 March 2003, the water was disposed by discharging on site.

Table 16
Analytical Results from Groundwater Sampling (mg/L)

Analyte	TMW-1		TMW-2				TMW-3						TMW-4			Standard
	5/3/00	2/21/01	5/3/00	641-1*	641-1FD	2/21/01	5/3/00	5/3/00 D	2/21/01	2/21/01 D	880-2**	880-2FD	5/3/00	2/21/01	880-1†	
Arsenic	0.101	0.0068	<0.080	**0.059**	**0.062**	0.0087	**<0.080**	**<0.080**	0.0079	0.0086	0.022	0.021	**<0.080**	0.0070	0.0082	0.05
Barium	0.584	0.124	0.498	0.538	0.545	0.146	0.285	0.265	0.233	0.202	0.299	0.291	0.175	0.148	0.188	1.0
Cadmium	**0.029**	**<0.020**	**0.032**	0.007	0.005	**<0.020**	**<0.020**	**<0.020**	**<0.020**	**<0.020**	<0.003	**0.012**	**<0.020**	**<0.020**	**0.025**	0.01
Chromium	**0.065**	0.020	**0.224**	**0.238**	**0.243**	0.048	0.036	0.031	**0.056**	0.045	0.040	0.052	0.049	**0.058**	0.043	0.05
Lead	**<0.10**	**<0.10**	**<0.10**	**0.072**	**0.093**	**<0.10**	**0.38**	**0.31**	**0.55**	**0.51**	**0.517**	**0.594**	**<0.10**	**<0.10**	0.017	0.05
Mercury	<0.00020	<0.00020	0.00024	0.00037	0.00037	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.00012	<0.0001	<0.0002	<0.0002	**0.00017**	**0.002**
Selenium	**<0.15**	<0.005	**<0.15**	<0.002	<0.002	<0.005	**<0.15**	**<0.15**	<0.005	<0.0050	<0.002	<0.002	**<0.15**	<0.005	<0.002	0.01
Silver	<0.020	<0.020	<0.020	<0.025	<0.025	<0.020	<0.020	0.030	<0.020	<0.020	<0.025	<0.025	<0.020	<0.020	<0.025	0.05
Turbidity	na	**472**	na	na	na	658	na	na	**2052**	**1830**	na	na	na	**341**	na	50

* EPA split sample and duplicate of TMW-2 from 5/3/00. **EPA Split sample and duplicate of TMW-3 from 2/21/01. †EPA split sample of TMW-4 from 2/21/01.

Table 17
Groundwater Metals Concentrations (mg/L) - Peristaltic Pump Sampling

Analyte	TMW-1				TMW-2				Standard
	04/26/01	11/29/01	04/30/02	09/12/02	4/26/01	11/29/01	4/30/02	9/12/02	
Arsenic	<0.0010	0.0039	0.0015	0.0040	0.0011	<0.0010	<0.0010	<0.0010	0.05
Barium	0.055	na	na	na	0.060	na	na	na	1.0
Cadmium	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.01
Chromium	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.05
Lead	<0.004	0.0012	0.0043	0.0088	<0.004	<0.0040	<0.0040	<0.0040	0.05
Mercury	<0.00020	na	na	na	<0.0002	na	na	na	0.002
Selenium	<0.0050	na	na	na	<0.005	na	na	na	0.01
Silver	<0.020	na	na	na	<0.020	na	na	na	0.05
Turbidity	16.8	**60***	7.9	35.5	**61.2**	****70**	5.5	1.5	50

na = not analyzed; *turbidity field measured only

Table 18
Groundwater Metals Concentrations (mg/L) - Peristaltic Pump Sampling

Analyte	TMW-3									Standard
	4/26/01	4/26/01D	11/29/01	11/29/01 D	1331-2**	4/30/02	4/30/02 D	9/12/02	9/12/02 D	
Arsenic	<0.0010	<0.0010	<0.0010	<0.0010	<0.002	<0.0010	<0.0010	<0.0010	<0.0010	0.05
Barium	0.033	0.032	na	na	0.0919	na	na	na	na	1.0
Cadmium	<0.0005	<0.0005	<0.0005	<0.0005	<0.003	<0.0005	<0.0005	<0.0005	<0.0005	0.01
Chromium	<0.020	<0.020	<0.020	<0.020	<0.015	<0.020	<0.020	<0.020	<0.020	0.05
Lead	<0.004	<0.004	<0.0040	<0.0040	0.00161	<0.0040	<0.0040	<0.0040	<0.0040	0.05
Mercury	<0.0002	<0.0002	na	na	<0.0002	na	na	na	na	0.002
Selenium	<0.005	<0.0050	na	na	<0.002	na	na	na	na	0.01
Silver	<0.020	<0.020	na	na	<0.025	na	na	na	na	0.05
Turbidity	1.5	na	1.3	0	na	1.6	1.0	3.3	3.1	50

na = not analyzed; *turbidity field measured only; **EPA split sample of TMW-3 from 11/29/01

Table 19
Groundwater Metals Concentrations (mg/L) - Peristaltic Pump Sampling

Analyte	TMW-4						Standard
	4/26/01	11/29/01	1331-1	1331-1FD	4/30/02	9/12/02	
Arsenic	0.0045	0.0028	0.00229	0.00241	0.0030	0.0030	0.05
Barium	0.090	na	0.0692	0.0696	na	na	1.0
Cadmium	<0.0005	0.0005	0.00731	<0.003	<0.0005	<0.0005	0.01
Chromium	<0.020	<0.020	<0.015	<0.015	<0.020	<0.020	0.05
Lead	<0.0040	<0.0040	<0.001	0.00127	<0.0040	<0.0040	0.05
Mercury	<0.0002	na	<0.00020	<0.00020	na	na	0.002
Selenium	<0.0050	na	<0.002	<0.002	na	na	0.01
Silver	<0.020	na	<0.025	<0.025	na	na	0.05
Turbidity	**68.1**	**60**	na	na	15	15.4	50

D=duplicate; na=not analyzed; *turbidity field-measured only; 1331-1 and 1331-1FD are EPA-split and duplicate of TMW-4 collected 11/29/01.

Table 20
Depth to Groundwater and Other Measured Parameters

Well	Depth to Groundwater, feet						pH					
	5/3/00	2/21/01	4/26/01	11/29/01	4/30/02	9/12/02	5/3/00	2/21/01	4/26/01	11/29/01	4/30/02	9/12/02
TMW-1	5.57	5.82	4.75	4.86	4.94	4.13	6.8	7.0	6.9	6.8	6.9	6.7
TMW-2	4.89	5.87	4.94	4.87	5.07	4.63	6.8	6.6	6.8	6.8	6.7	6.7
TMW-3	5.57	6.09	5.09	5.11	4.14	4.86	6.9	6.9	6.7	6.6	6.65	6.7
TMW-4	3.35	6.10	4.64	5.10	4.81	4.87	6.9	7.3	6.7	6.7	6.71	6.8
Well	**Temperature, °F**						**Conductivity**					
	5/03/00	2/21/01	4/26/01	11/29/01	4/30/02	9/12/02	5/03/00	2/21/01	4/26/01	11/29/01	4/30/02	9/12/02
TMW-1	63	46	56	54	57	61	410	570	400	320	290	320
TMW-2	58	47	57	54	58	59	280	360	370	330	300	300
TMW-3	61	46	58	56	57	59	430	650	120	130	120	160
TMW-4	60	47	55	54	55	58	500	490	560	570	500	490

6.0 CONCLUSION

At Hawkeye Castings, an area approximately 500 ft x 200 ft west of the plant was affected by on-site disposal of waste foundry sand over a period of many years. The sand was piled west of the foundry building and periodically graded across the site, becoming mixed with fill material and later covered with fill and topsoil. Because it was shown that some portion of the sand failed a test for the characteristic of toxicity with respect to lead, closure was required in accordance with 40 CFR 264 Subparts F and G.

As set out in the EPA-approved Closure Plan and amendments, activities were carried out to collect representative surface soil, subsurface soil, and groundwater samples at the site. These activities were monitored by an employee of the U.S. Geological Survey, representing the U.S. Environmental Protection Agency Region 7. Sample collection and management was carried out in compliance with the procedures detailed in the Closure Plan. The procedure for groundwater collection was revised to allow use of a peristaltic pump after it was shown that manual bailing could not produce a sample meeting turbidity limits set for this site.

In each case, after appropriate analysis was conducted by a qualified laboratory, concentrations of hazardous constituents in each sample were compared to Closure Performance Standards set for this site. As needed, soil was excavated and disposed off-site to remove material containing lead in excess of the closure standards. Storage of excavated soil on site consisted of staging piles constructed and maintained in accordance with an EPA-approved design. Confirming samples were collected following each removal, including removal of the staging piles, to verify that no residual lead remained at concentrations posing a significant risk to human health or the environment.

As discussed in the previous sections of this report, it has been demonstrated that, as intended this site has met the requirements for certification of clean closure. Closure activities are now complete and no further action is contemplated for this facility.

Carol E. Wilson

Carol E. Wilson, Project Manager
CHEM-ECO Environmental, Inc.

8 May 2003

7.0 CLOSURE CERTIFICATION

As laid out in the preceding sections, closure procedures were carried out in accordance with the approved Closure Plan. As needed, the plan was amended to include additional closure activities. This work now having been completed, Certification of Closure is made as follows:

> I certify, under penalty of law, that this document and all appendixes and attachments as applicable were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Hawkeye Castings
IAD 984599589

John S. Tyrrell MD.
John D. Tyrrell, M.D., Owner

5/22/03
Date

For *CHEM-ECO Environmental, Inc.*

William D. Wilson
William D. Wilson, P.E.
Reg. No. E-2340
Registration expires 31 Dec 2004

May 13, 2003
Date

Appendix A
Title 40, Code of Federal Regulations, Part 264, Subparts F and G

264 Subpart F Releases From Solid Waste Management Units

264.90 Applicability.

264.90(a)(1) Except as provided in paragraph (b) of this section, the regulations in this subpart apply to owners or ope treat, store or dispose of hazardous waste. The owner or operator must satisfy the requirements identified in paragrap for all wastes (or constituents thereof) contained in solid waste management units at the facility, regardless of the time placed in such units.

264.90(a)(2) All solid waste management units must comply with the requirements in °264.101. A surface impoundme land treatment unit or landfill that receives hazardous waste after July 26, 1982 (hereinafter referred to as a ``regulatec with the requirements of °°264.91 through 264.100 in lieu of °264.101 for purposes of detecting, characterizing and res to the uppermost aquifer. The financial responsibility requirements of °264.101 apply to regulated units.

264.90(b) The owner or operator's regulated unit or units are not subject to regulation for releases into the uppermost aquifer ur

264.90(b)(1) The owner or operator is exempted under °264.1; or
264.90(b)(2) He operates a unit which the Regional Administrator finds:
264.90(b)(2)(i) Is an engineered structure,
264.90(b)(2)(ii) Does not receive or contain liquid waste or waste containing free liquids,
264.90(b)(2)(iii) Is designed and operated to exclude liquid, precipitation, and other run-on and run-off,
264.90(b)(2)(iv) Has both inner and outer layers of containment enclosing the waste,
264.90(b)(2)(v) Has a leak detection system built into each containment layer,
264.90(b)(2)(vi) The owner or operator will provide continuing operation and maintenance of these leak detec during the active life of the unit and the closure and post-closure care periods, and
264.90(b)(2)(vii) To a reasonable degree of certainty, will not allow hazardous constituents to migrate beyond containment layer prior to the end of the the post-closure care period.

264.90(b)(3) The Regional Administrator finds, pursuant to °264.280 (d), that the treatment zone of a land treatment u regulated unit does not contain levels of hazardous constituents that are above background levels of those constituent statistically significant, and if an unsaturated zone monitoring program meeting the requirements of °264.278 has not significant increase in hazardous constituents below the treatment zone during the operating life of the unit. An exempt paragraph can only relieve an owner or operator of responsibility to meet the requirements of this subpart during the p period; or

264.90(b)(4) The Regional Administrator finds that there is no potential for migration of liquid from a regulated unit to t during the active life of the regulated unit (including the closure period) and the port-closure care period specified unde demonstration must be certified by a qualified geologist or geotechnical engineer. In order to provide an adequate mar prediction of potential migration of liquid, the owner or operator must base any predictions made under this paragraph maximize the rate of liquid migration.

264.90(b)(5) He designs and operates a pile in compliance with °264.250 (c).

264.90(c) The regulations under this subpart apply during the active life of the regulated unit (including the closure period). Afte regulated unit, the regulations in this subpart:

264.90(c)(1) Do not apply if all waste, waste residues, contaminated containment system components, and contamina removed or decontaminated at closure;

264.90(c)(2) Apply during the post-closure care period under °264.117 if the owner or operator is conducting a detectic program under °264.98; or

264.90(c)(3) Apply during the compliance period under °264.96 if the owner or operator is conducting a compliance m under °264.99 or a corrective action program under °264.100.

264.90(d) Regulations in this subpart may apply to miscellaneous units when necessary to comply with °°264.601 through 264.

[47 FR 32350, July 26, 1982, as amended at 50 FR 28746, July 15, 1985; 52 FR 46963, Dec. 10, 1987]

264.91 Required programs.

264.91(a) Owners and operators subject to this subpart must conduct a monitoring and response program as follows:

264.91(a)(1) Whenever hazardous constituents under °264.93 from a regulated unit are detected at a compliance poin owner or operator must institute a compliance monitoring program under °264.99. Detected is defined as statistically s contamination as described in °264.98 (f);

264.91(a)(2) Whenever the ground-water protection standard under °264.92 is exceeded, the owner or operator must i action program under °264.100. Exceeded is defined as statistically significant evidence of increased contamination as (d);

264.91(a)(3) Whenever hazardous constituents under °264.93 from a regulated unit exceed concentration limits under water between the compliance point under °264.95 and the downgradient facility property boundary, the owner or oper corrective action program under °264.100; or

264.91(a)(4) In all other cases, the owner or operator must institute a detection monitoring program under °264.98.

264.91(b) The Regional Administrator will specify in the facility permit the specific elements of the monitoring and response pro Administrator may include one or more of the programs identified in paragraph (a) of this section in the facility permit as may b human health and the environment and will specify the circumstances under which each of the programs will be required. In de the owner or operator to be prepared to institute a particular program, the Regional Administrator will consider the potential adv health and the environment that might occur before final administrative action on a permit modification application to incorpora be taken.

[47 FR 32350, July 26, 1982, as amended at 53 FR 39728, Oct. 11, 1988]

264.92 Ground-water protection standard. The owner or operator must comply with conditions specified in the facility perm designed to ensure that hazardous constituents under °264.93 detected in the ground water from a regulated unit do not exceed the concentration limits under °264.94 in the uppermost aquifer underlying the waste management of compliance under °264.95 during the compliance period under °264.96. The Regional Administrator will establish this ground standard in the facility permit when hazardous constituents have been detected in the ground water.

[53 FR 39728, Oct. 11, 1988]

264.93 Hazardous constituents.

264.93(a) The Regional Administrator will specify in the facility permit the hazardous constituents to which the ground-water pr °264.92 applies. Hazardous constituents are constituents identified in appendix VIII of part 261 of this chapter that have been d in the uppermost aquifer underlying a regulated unit and that are reasonably expected to be in or derived from waste contained unless the Regional Administrator has excluded them under paragraph (b) of this section.

264.93(b) The Regional Administrator will exclude an appendix VIII constituent from the list of hazardous constituents specified

finds that the constituent is not capable of posing a substantial present or potential hazard to human health or the environment. grant an exemption, the Regional Administrator will consider the following:

264.93(b)(1) Potential adverse effects on ground-water quality, considering:

264.93(b)(1)(i) The physical and chemical characteristics of the waste in the regulated unit, including its poter
264.93(b)(1)(ii) The hydrogeological characteristics of the facility and surrounding land;
264.93(b)(1)(iii) The quantity of ground water and the direction of ground-water flow;
264.93(b)(1)(iv) The proximity and withdrawal rates of ground-water users;
264.93(b)(1)(v) The current and future uses of ground water in the area;
264.93(b)(1)(vi) The existing quality of ground water, including other sources of contamination and their cumu the ground-water quality;
264.93(b)(1)(vii) The potential for health risks caused by human exposure to waste constituents;
264.93(b)(1)(viii) The potential damage to wildlife, crops, vegetation, and physical structures caused by expos constituents;
264.93(b)(1)(ix) The persistence and permanence of the potential adverse effects; and

264.93(b)(2) Potential adverse effects on hydraulically-connected surface water quality, considering:

264.93(b)(2)(i) The volume and physical and chemical characteristics of the waste in the regulated unit;
264.93(b)(2)(ii) The hydrogeological characteristics of the facility and surrounding land;
264.93(b)(2)(iii) The quantity and quality of ground water, and the direction of ground-water flow;
264.93(b)(2)(iv) The patterns of rainfall in the region;
264.93(b)(2)(v) The proximity of the regulated unit to surface waters;
264.93(b)(2)(vi) The current and future uses of surface waters in the area and any water quality standards est surface waters;
264.93(b)(2)(vii) The existing quality of surface water, including other sources of contamination and the cumu surface-water quality;
264.93(b)(2)(viii) The potential for health risks caused by human exposure to waste constituents;
264.93(b)(2)(ix) The potential damage to wildlife, crops, vegetation, and physicalstructures caused by exposu constituents; and
264.93(b)(2)(x) The persistence and permanence of the potential adverse effects.

264.93(c) In making any determination under paragraph (b) of this section about the use of ground water in the area around the Administrator will consider any identification of underground sources of drinking water and exempted aquifers made under °144

[47 FR 32350, July 26, 1982, as amended at 48 FR 14294, Apr. 1, 1983]

264.94 Concentration limits.

264.94(a) The Regional Administrator will specify in the facility permit concentration limits in the ground water for hazardous cc under °264.93. The concentration of a hazardous constituent:

264.94(a)(1) Must not exceed the background level of that constituent in the ground water at the time that limit is spec

264.94(a)(2) For any of the constituents listed in Table 1, must not exceed the respective value given in that table if the the constituent is below the value given in Table 1; or

264.94(a)(3) Must not exceed an alternate limit established by the Regional Administrator under paragraph (b) of this s

264 Subpart G Closure and Post-Closure

°264.110 Applicability.
°264.111 Closure performance standard.
°264.112 Closure plan; amendment of plan.
°264.113 Closure; time allowed for closure.
°264.114 Disposal or decontamination of equipment, structures and soils.
°264.115 Certification of closure.
°264.116 Survey plat.
°264.117 Post-closure care and use of property.
°264.118 Post-closure plan; amendment of plan.

°264.119 Post-closure notices.
°264.120 Certification of completion of post-closure care.

264.110 Applicability. Except as °264.1 provides otherwise:

264.110(a) Sections 264.111 through 264.115 (which concern closure) apply to the owners and operators of all hazardous wast and

264.110(b) Sections 264.116 through 264.120 (which concern post-closure care) apply to the owners and operators of:
264.110(b)(1) All hazardous waste disposal facilities;
264.110(b)(2) Waste piles and surface impoundments from which the owner or operator intends to remove the wastes extent that these sections are made applicable to such facilities in °264.228 or °264.258;
264.110(b)(3) Tank systems that are required under °264.197 to meet the requirements for landfills; and
264.110(b)(4) Containment buildings that are required under ° 264.1102 to meet the requirement for landfills.

[51 FR 16444, May 2, 1986, as amended at 51 FR 25472, July 14, 1986; 57 FR 37264, Aug. 18, 1992]

264.111 Closure performance standard.

The owner or operator must close the facility in a manner that:

264.111(a) Minimizes the need for further maintenance; and

264.111(b) Controls, minimizes or eliminates, to the extent necessary to protect human health and the environment, post-closu waste, hazardous constituents, leachate, contaminated run-off, or hazardous waste decomposition products to the ground or su atmosphere; and

264.111(c) Complies with the closure requirements of this subpart, including, but not limited to, the requirements of °° 264.178, 264.258, 264.280, 264.310, 264.351, 264.601 through 264.603, and 264.1102.

[51 FR 16444, May 2, 1986, as amended at 52 FR 46963, Dec. 10, 1987;
57 FR 37264, Aug. 18, 1992]

264.112 Closure plan; amendment of plan.

264.112(a) Written plan.

264.112(a)(1) The owner or operator of a hazardous waste management facility must have a written closure plan. In a surface impoundments and waste piles from which the owner or operator intends to remove or decontaminate the haz partial or final closure are required by °°264.228 (c)(1)(i) and 264.258 (c)(1)(i) to have contingent closure plans. The pl with the permit application, in accordance with °270.14 (b)(13) of this chapter, and approved by the Regional Administ permit issuance procedures under part 124 of this chapter. In accordance with °270.32 of this chapter, the approved cl become a condition of any RCRA permit.

264.112(a)(2) The Director's approval of the plan must ensure that the approved closure plan is consistent with °° 264. and the applicable requirements of subpart F of this part, °° 264.178, 264.197, 264.228, 264.258, 264.280, 264.310, 2 264.1102. Until final closure is completed and certified in accordance with ° 264.115, a copy of the approved plan and must be furnished to the Director upon request, including requests by mail.

264.112(b) Content of plan. The plan must identify steps necessary to perform partial and/or final closure of the facility at any active life. The closure plan must include, at least:

264.112(b)(1) A description of how each hazardous waste management unit at the facility will be closed in accordance

264.112(b)(2) A description of how final closure of the facility will be conducted in accordance with °264.111. The desc the maximum extent of the operations which will be unclosed during the active life of the facility; and

264.112(b)(3) An estimate of the maximum inventory of hazardous wastes ever on-site over the active life of the facilit description of the methods to be used during partial closures and final closure, including, but not limited to, methods fc transporting, treating, storing, or disposing of all hazardous wastes, and identification of the type(s) of the off-site haza management units to be used, if applicable; and

264.112(b)(4) A detailed description of the steps needed to remove or decontaminate all hazardous waste residues an containment system components, equipment, structures, and soils during partial and final closure, including, but not li for cleaning equipment and removing contaminated soils, methods for sampling and testing surrounding soils, and crit the extent of decontamination required to satisfy the closure performance standard; and

264.112(b)(5) A detailed description of other activities necessary during the closure period to ensure that all partial clo closure satisfy the closure performance standards, including, but not limited to, ground-water monitoring, leachate coll and run-off control; and

264.112(b)(6) A schedule for closure of each hazardous waste management unit and for final closure of the facility. Th include, at a minimum, the total time required to close each hazardous waste management unit and the time required closure activities which will allow tracking of the progress of partial and final closure. (For example, in the case of a lar the time required to treat or dispose of all hazardous waste inventory and of the time required to place a final cover mu

264.112(b)(7) For facilities that use trust funds to establish financial assurance under °264.143 or °264.145 and that a prior to the expiration of the permit, an estimate of the expected year of final closure.

264.112(c) Amendment of plan. The owner or operator must submit a written notification of or request for a permit modificatic a change in operating plans, facility design, or the approved closure plan in accordance with the applicable procedures in parts written notification or request must include a copy of the amended closure plan for review or approval by the Regional Administ

264.112(c)(1) The owner or operator may submit a written notification or request to the Regional Administrator for a pe amend the closure plan at any time prior to the notification of partial or final closure of the facility.

264.112(c)(2) The owner or operator must submit a written notification of or request for a permit modification to autho approved closure plan whenever:

264.112(c)(2)(i) Changes in operating plans or facility design affect the closure plan, or
264.112(c)(2)(ii) There is a change in the expected year of closure, if applicable, or
264.112(c)(2)(iii) In conducting partial or final closure activities, unexpected events require a modification of t closure plan.

264.112(c)(3) The owner or operator must submit a written request for a permit modification including a copy of the ar for approval at least 60 days prior to the proposed change in facility design or operation, or no later than 60 days after has occurred which has affected the closure plan. If an unexpected event occurs during the partial or final closure peri operator must request a permit modification no later than 30 days after the unexpected event. An owner or operator of impoundment or waste pile that intends to remove all hazardous waste at closure and is not otherwise required to prep closure plan under °264.228 (c)(1)(i) or °264.258 (c)(1)(i), must submit an amended closure plan to the Regional Adm 60 days from the date that the owner or operator or Regional Administrator determines that the hazardous waste man closed as a landfill, subject to the requirements of °264.310, or no later than 30 days from that date if the determinatio partial or final closure. The Regional Administrator will approve, disapprove, or modify this amended plan in accordan procedures in parts 124 and 270. In accordance with °270.32 of this chapter, the approved closure plan will become a RCRA permit issued.

264.112(c)(4) The Regional Administrator may request modifications to the plan under the conditions described in °26 owner or operator must submit the modified plan within 60 days of the Regional Administrator's request, or within 30 c facility conditions occurs during partial or final closure. Any modifications requested by the Regional Administrator will accordance with the procedures in parts 124 and 270.

264.112(d) Notification of partial closure and final closure.

264.112(d)(1) The owner or operator must notify the Regional Administrator in writing at least 60 days prior to the date to begin closure of a surface impoundment, waste pile, land treatment or landfill unit, or final closure of a facility with s or operator must notify the Regional Administrator in writing at least 45 days prior to the date on which he expects to b facility with only treatment or storage tanks, container storage, or incinerator units to be closed. The owner or operator Regional Administrator in writing at least 45 days prior to the date on which he expects to begin partial or final closure industrial furnace, whichever is earlier.

264.112(d)(2) The date when he ``expects to begin closure" must be either:

264.112(d)(2)(i) No later than 30 days after the date on which any hazardous waste management unit receive volume of hazardous wastes, or if there is a reasonable possibility that the hazardous waste management un

additional hazardous wastes, no later than one year after the date on which the unit received the most recent hazardous wastes. If the owner or operator of a hazardous waste management unit can demonstrate to the R Administrator that the hazardous waste management unit or facility has the capacity to receive additional haz he has taken all steps to prevent threats to human health and the environment, including compliance with all requirements, the Regional Administrator may approve an extension to this one-year limit; or
264.112(d)(2)(ii) For units meeting the requirements of °264.113 (d), no later than 30 days after the date on w waste management unit receives the known final volume of non-hazardous wastes, or if there is a reasonable hazardous waste management unit will receive additional non-hazardous wastes, no later than one year after the unit received the most recent volume of non-hazardous wastes. If the owner or operator can demonstrate Administrator that the hazardous waste management unit has the capacity to receive additional non-hazardou has taken, and will continue to take, all steps to prevent threats to human health and the environment, includi all applicable permit requirements, the Regional Administrator may approve an extension to this one-year lim

264.112(d)(3) If the facility's permit is terminated, or if the facility is otherwise ordered, by judicial decree or final order RCRA, to cease receiving hazardous wastes or to close, then the requirements of this paragraph do not apply. Howeve operator must close the facility in accordance with the deadlines established in °264.113.

264.112(e) Removal of wastes and decontamination or dismantling of equipment. Nothing in this section shall preclude the owner or operator from removing hazardous wastes and decontaminating or dismantling equipment in accordance partial or final closure plan at any time before or after notification of partial or final closure.

[51 FR 16444, May 2, 1986, as amended at 52 FR 46963, Dec. 10, 1987; 53 FR 37935, Sept. 28, 1988; 54 FR 33394, Aug. 14, 21, 1991; 57 FR 37265, Aug. 18, 1992; 58 18014, Apr. 7, 1993]

264.113 Closure; time allowed for closure.

264.113(a) Within 90 days after receiving the final volume of hazardous wastes, or the final volume of non-hazardous wastes if complies with all applicable requirements in paragraphs (d) and (e) of this section, at a hazardous waste management unit or fa operator must treat, remove from the unit or facility, or dispose of on-site, all hazardous wastes in accordance with the approve Regional Administrator may approve a longer period if the owner or operator complies with all applicable requirements for requ the permit and demonstrates that:

264.113(a)(1)(i) The activities required to comply with this paragraph will, of necessity, take longer than 90 da
264.113(a)(1)(ii)(A)The hazardous waste management unit or facility has the capacity to receive adc hazardous wastes, or has the capacity to receive non-hazardous wastes if the owner or operator com paragraphs (d) and (e) of this section; and
264.113(a)(1)(ii)(B)There is a reasonable likelihood that he or another person will recommence oper hazardous waste management unit or the facility within one year; and
264.113(a)(1)(ii)(C) Closure of the hazardous waste management unit or facility would be incompati continued operation of the site; and

264.113(a)(2) He has taken and will continue to take all steps to prevent threats to human health and the environment with all applicable permit requirements.

264.113(b) The owner or operator must complete partial and final closure activities in accordance with the approved closure pla after receiving the final volume of hazardous wastes, or the final volume of non-hazardous wastes if the owner or operator com requirements in paragraphs (d) and (e) of this section, at the hazardous waste management unit or facility. The Regional Admi extension to the closure period if the owner or operator complies with all applicable requirements for requesting a modification t demonstrates that:

264.113(b)(1)(i) The partial or final closure activities will, of necessity, take longer than 180 days to complete
264.113(b)(1)(ii)(A) The hazardous waste management unit or facility has the capacity to receive ad hazardous wastes, or has the capacity to receive non-hazardous wastes if the owner or operator con paragraphs (d) and (e) of this section; and
264.113(b)(1)(ii)(B) There is reasonable likelihood that he or another person will recommence opera hazardous waste management unit or the facility within one year; and
264.113(b)(1)(ii)(C) Closure of the hazardous waste management unit or facility would be incompati continued operation of the site; and

264.113(b)(2) He has taken and will continue to take all steps to prevent threats to human health and the environment not operating hazardous waste management unit or facility, including compliance with all applicable permit requiremer

264.113(c) The demonstrations referred to in paragraphs (a)(1) and (b)(1) of this section must be made as follows:

264.113(c)(1) The demonstrations in paragraph (a)(1) of this section must be made at least 30 days prior to the expira period in paragraph (a) of this section; and

264.113(c)(2) The demonstration in paragraph (b)(1) of this section must be made at least 30 days prior to the expirat period in paragraph (b) of this section, unless the owner or operator is otherwise subject to the deadlines in paragraph

264.113(d) The Regional Administrator may allow an owner or operator to receive only non-hazardous wastes in a landfill, land impoundment unit after the final receipt of hazardous wastes at that unit if:

264.113(d)(1) The owner or operator requests a permit modification in compliance with all applicable requirements in p this title and in the permit modification request demonstrates that:

264.113(d)(1)(i) The unit has the existing design capacity as indicated on the part A application to receive nor wastes; and
264.113(d)(1)(ii) There is a reasonable likelihood that the owner or operator or another person will receive nor wastes in the unit within one year after the final receipt of hazardous wastes; and
264.113(d)(1)(iii) The non-hazardous wastes will not be incompatible with any remaining wastes in the unit, o design and operating requirements of the unit or facility under this part; and
264.113(d)(1)(iv) Closure of the hazardous waste management unit would be incompatible with continued ope or facility; and
264.113(d)(1)(v) The owner or operator is operating and will continue to operate in compliance with all applica requirements; and

264.113(d)(2) The request to modify the permit includes an amended waste analysis plan, ground-water monitoring ar human exposure assessment required under RCRA section 3019, and closure and post-closure plans, and updated co demonstrations of financial assurance for closure and post-closure care as necessary and appropriate, to reflect any c presence of hazardous constituents in the non-hazardous wastes, and changes in closure activities, including the expe applicable under °264.112 (b)(7), as a result of the receipt of non-hazardous wastes following the final receipt of hazar

264.113(d)(3) The request to modify the permit includes revisions, as necessary and appropriate, to affected condition account for the receipt of non-hazardous wastes following receipt of the final volume of hazardous wastes; and

264.113(d)(4) The request to modify the permit and the demonstrations referred to in paragraphs (d)(1) and (d)(2) of th submitted to the Regional Administrator no later than 120 days prior to the date on which the owner or operator of the known final volume of hazardous wastes at the unit, or no later than 90 days after the effective date of this rule in the s is located, whichever is later.

264.113(e) In addition to the requirements in paragraph (d) of this section, an owner or operator of a hazardous waste surface i in compliance with the liner and leachate collection system requirements in 42 U.S.C. 3004(o)(1) and 3005(j)(1) or 42 U.S.C. 3 3005(j) (2), (3), (4) or (13) must:

264.113(e)(1) Submit with the request to modify the permit:

264.113(e)(1)(i) A contingent corrective measures plan, unless a corrective action plan has already been subr °264.99; and
264.113(e)(1)(ii) A plan for removing hazardous wastes in compliance with paragraph (e)(2) of this section; a

264.113(e)(2) Remove all hazardous wastes from the unit by removing all hazardous liquids, and removing all hazardo extent practicable without impairing the integrity of the liner(s), if any.

264.113(e)(3) Removal of hazardous wastes must be completed no later than 90 days after the final receipt of hazardo Regional Administrator may approve an extension to this deadline if the owner or operator demonstrates that the remo wastes will, of necessity, take longer than the allotted period to complete and that an extension will not pose a threat to the environment.

264.113(e)(4) If a release that is a statistically significant increase (or decrease in the case of pH) over background va monitoring parameters or constituents specified in the permit or that exceeds the facility's ground-water protection star compliance, if applicable, is detected in accordance with the requirements in subpart F of this part, the owner or opera

264.113(e)(4)(i) Must implement corrective measures in accordance with the approved contingent corrective

required by paragraph (e)(1) of this section no later than one year after detection of the release, or approval c corrective measures plan, whichever is later;
264.113(e)(4)(ii) May continue to receive wastes at the unit following detection of the release only if the apprc measures plan includes a demonstration that continued receipt of wastes will not impede corrective action; ar
264.113(e)(4)(iii) May be required by the Regional Administrator to implement corrective measures in less tha cease the receipt of wastes until corrective measures have been implemented if necessary to protect human h environment.

264.113(e)(5) During the period of corrective action, the owner or operator shall provide semi-annual reports to the Re that describe the progress of the corrective action program, compile all ground-water monitoring data, and evaluate th continued receipt of non-hazardous wastes on the effectiveness of the corrective action.

264.113(e)(6) The Regional Administrator may require the owner or operator to commence closure of the unit if the ov to implement corrective action measures in accordance with the approved contingent corrective measures plan within in paragraph (e)(4) of this section, or fails to make substantial progress in implementing corrective action and achievir ground-water protection standard or background levels if the facility has not yet established a ground-water protection

264.113(e)(7) If the owner or operator fails to implement corrective measures as required in paragraph (e)(4) of this se Regional Administrator determines that substantial progress has not been made pursuant to paragraph (e)(6) of this s

264.113(e)(7)(i) Notify the owner or operator in writing that the owner or operator must begin closure in accor deadlines in paragraphs (a) and (b) of this section and provide a detailed statement of reasons for this determ
264.113(e)(7)(ii) Provide the owner or operator and the public, through a newspaper notice, the opportunity tc comments on the decision no later than 20 days after the date of the notice.
264.113(e)(7)(iii) If the Regional Administrator receives no written comments, the decision will become final fi close of the comment period. The Regional Administrator will notify the owner or operator that the decision is revised closure plan, if necessary, must be submitted within 15 days of the final notice and that closure must accordance with the deadlines in paragraphs (a) and (b) of this section.
264.113(e)(7)(iv) If the Regional Administrator receives written comments on the decision, he shall make a fir 30 days after the end of the comment period, and provide the owner or operator in writing and the public throu notice, a detailed statement of reasons for the final decision. If the Regional Administrator determines that su has not been made, closure must be initiated in accordance with the deadlines in paragraphs (a) and (b) of th
264.113(e)(7)(v) The final determinations made by the Regional Administrator under paragraphs (e)(7) (iii) ar section are not subject to administrative appeal.

[51 FR 16444, May 2, 1986, as amended at 54 FR 33394, Aug. 14, 1989; 58 18014, Apr. 7, 1993

264.114 Disposal or decontamination of equipment, structures and soils.

During the partial and final closure periods, all contaminated equipment, structures and soils must be properly disposed of or d otherwise specified in °°264.197, 264.228, 264.258, 264.280 or °264.310. By removing any hazardous wastes or hazardous cor and final closure, the owner or operator may become a generator of hazardous waste and must handle that waste in accordanc requirements of part 262 of this chapter.

[51 FR 16444, May 2, 1986, as amended at 52 FR 46963, Dec. 10, 1987; 53 FR 34086, Sept. 2, 1988]

264.115 Certification of closure.

Within 60 days of completion of closure of each hazardous waste surface impoundment, waste pile, land treatment, and landfil of the completion of final closure, the owner or operator must submit to the Regional Administrator, by registered mail, a certifi waste management unit or facility, as applicable, has been closed in accordance with the specifications in the approved closure must be signed by the owner or operator and by an independent registered professional engineer. Documentation supporting th registered professional engineer's certification must be furnished to the Regional Administrator upon request until he releases t from the financial assurance requirements for closure under °264.143 (i).

[58 18014, Apr. 7, 1993]

264.116 Survey plat.

No later than the submission of the certification of closure of each hazardous waste disposal unit, the owner or operator must s authority, or the authority with jurisdiction over local land use, and to the Regional Administrator, a survey plat indicating the lo landfills cells or other hazardous waste disposal units with respect to permanently surveyed benchmarks. This plat must be pre

professional land surveyor. The plat filed with the local zoning authority, or the authority with jurisdiction over local land use, m prominently displayed, which states the owner's or operator's obligation to restrict disturbance of the hazardous waste disposal the applicable subpart G regulations.
[58 18014, Apr. 7, 1993]

Table 1 Maximum Concentration of Constituents for Ground-water Protection			
Constituent	Maximum concentration [1]	Constituent	Maximum concentration [1]
Arsenic	0.05	Endrin(1,2,3,4,10,10-hexachloro-1,7-epoxy-1,4,4a,5,6,7,8,9a-octahydro-1,4-endo, endo-5,8-dimethanonaphthalene)	0.0002
Barium	1.0	Lindane (1,2,3,4,5,6-hexachlorocyclohexane, gamma isomer)	0.004
Cadmium	0.01	Methoxychlor (1,1,1-Trichloro- 2,2-bis (p-methoxyphenylethane)	0.1
Chromium	0.05	Toxaphene (C10H10Cl6, Technical chlorinated camphene, 67-69 percent chlorine)	0.005
Lead	0.05	2,4-D (2,4- Dichlorophenoxyacetic acid)	0.1
Mercury	0.002	2,4,5-TP Silvex (2,4,5-Trichlorophenoxypropionic acid)	0.01
Selenium	0.01		
Silver	0.05		
[1] Milligrams per liter.			

264.94(b) The Regional Administrator will establish an alternate concentration limit for a hazardous constituent if he finds that t pose a substantial present or potential hazard to human health or the environment as long as the alternate concentration limit i establishing alternate concentration limits, the Regional Administrator will consider the following factors:

264.94(b)(1) Potential adverse effects on ground-water quality, considering:

264.94(b)(1)(i) The physical and chemical characteristics of the waste in the regulated unit, including its pote
264.94(b)(1)(ii) The hydrogeological characteristics of the facility and surrounding land;
264.94(b)(1)(iii) The quantity of ground water and the direction of ground-water flow;
264.94(b)(1)(iv) The proximity and withdrawal rates of ground-water users;
264.94(b)(1)(v) The current and future uses of ground water in the area;
264.94(b)(1)(vi) The existing quality of ground water, including other sources of contamination and their cumu the ground-water quality;
264.94(b)(1)(vii) The potential for health risks caused by human exposure to waste constituents;
264.94(b)(1)(viii) The potential damage to wildlife, crops, vegetation, and physical structures caused by expos constituents;
264.94(b)(1)(ix) The persistence and permanence of the potential adverse effects; and

264.94(b)(2) Potential adverse effects on hydraulically-connected surface-water quality, considering:

264.94(b)(2)(i) The volume and physical and chemical characteristics of the waste in the regulated unit;
264.94(b)(2)(ii) The hydrogeological characteristics of the facility and surrounding land;
264.94(b)(2)(iii) The quantity and quality of ground water, and the direction of ground-water flow;
264.94(b)(2)(iv) The patterns of rainfall in the region;
264.94(b)(2)(v) The proximity of the regulated unit to surface waters;
264.94(b)(2)(vi) The current and future uses of surface waters in the area and any water quality standards es surface waters;
264.94(b)(2)(vii) The existing quality of surface water, including other sources of contamination and the cumu surface water quality;
264.94(b)(2)(viii) The potential for health risks caused by human exposure to waste constituents;
264.94(b)(2)(ix) The potential damage to wildlife, crops, vegetation, and physical structures caused by expos constituents; and
264.94(b)(2)(x) The persistence and permanence of the potential adverse effects.

264.94(c) In making any determination under paragraph (b) of this section about the use of ground water in the area around the Administrator will consider any identification of underground sources of drinking water and exempted aquifers made under °14

[47 FR 32350, July 26, 1982, as amended at 48 FR 14294, Apr. 1, 1983]

264.95 Point of compliance.

264.95(a) The Regional Administrator will specify in the facility permit the point of compliance at which the ground-water protec applies and at which monitoring must be conducted. The point of compliance is a vertical surface located at the hydraulically dc waste management area that extends down into the uppermost aquifer underlying the regulated units.

264.95(b) The waste management area is the limit projected in the horizontal plane of the area on which waste will be placed d regulated unit.

264.95(b)(1) The waste management area includes horizontal space taken up by any liner, dike, or other barrier desig in a regulated unit.

264.95(b)(2) If the facility contains more than one regulated unit, the waste management area is described by an imag circumscribing the several regulated units.

264.96 Compliance period.

264.96(a) The Regional Administrator will specify in the facility permit the compliance period during which the ground-water prc °264.92 applies. The compliance period is the number of years equal to the active life of the waste management area (including management activity prior to permitting, and the closure period.)

264.96(b) The compliance period begins when the owner or operator initiates a compliance monitoring program meeting the re

264.96(c) If the owner or operator is engaged in a corrective action program at the end of the compliance period specified in pa section, the compliance period is extended until the owner or operator can demonstrate that the ground-water protection standa has not been exceeded for a period of three consecutive years.

264.97 General ground-water monitoring requirements. The owner or operator must comply with the following requiremer for any ground-water monitoring program developed to satisfy °264.98, °264.99, or °264.100:

264.97(a) The ground-water monitoring system must consist of a sufficient number of wells, installed at appropriate locations a ground-water samples from the uppermost aquifer that:

264.97(a)(1) Represent the quality of background water that has not been affected by leakage from a regulated unit;

264.97(a)(1)(i) A determination of background quality may include sampling of wells that are not hydraulically waste management area where:

264.97(a)(1)(i)(A) Hydrogeologic conditions do not allow the owner or operator to determine what we hydraulically upgradient; and

264.97(a)(1)(i)(B) Sampling at other wells will provide an indication of background ground-water qua representative or more representative than that provided by the upgradient wells; and

264.97(a)(2) Represent the quality of ground water passing the point of compliance.

264.97(a)(3) Allow for the detection of contamination when hazardous waste or hazardous constituents have migrated management area to the uppermost aquifer.

264.97(b) If a facility contains more than one regulated unit, separate ground-water monitoring systems are not required for ea provided that provisions for sampling the ground water in the uppermost aquifer will enable detection and measurement at the hazardous constituents from the regulated units that have entered the ground water in the uppermost aquifer.

264.97(c) All monitoring wells must be cased in a manner that maintains the integrity of the monitoring-well bore hole. This cas perforated and packed with gravel or sand, where necessary, to enable collection of ground-water samples. The annular space the bore hole and well casing) above the sampling depth must be sealed to prevent contamination of samples and the ground v

264.97(d) The ground-water monitoring program must include consistent sampling and analysis procedures that are designed t results that provide a reliable indication of ground-water quality below the waste management area. At a minimum the program procedures and techniques for:

264.97(d)(1) Sample collection;

264.97(d)(2) Sample preservation and shipment;

264.97(d)(3) Analytical procedures; and

264.97(d)(4) Chain of custody control.

264.97(e) The ground-water monitoring program must include sampling and analytical methods that are appropriate for ground accurately measure hazardous constituents in ground-water samples.

264.97(f) The ground-water monitoring program must include a determination of the ground-water surface elevation each time sampled.

264.97(g) In detection monitoring or where appropriate in compliance monitoring, data on each hazardous constituent specified collected from background wells and wells at the compliance point(s). The number and kinds of samples collected to establish appropriate for the form of statistical test employed, following generally accepted statistical principles. The sample size shall be to ensure with reasonable confidence that a contaminant release to ground water from a facility will be detected. The owner or o an appropriate sampling procedure and interval for each hazardous constituent listed
in the facility permit which shall be specified in the unit permit upon approval by the Regional Administrator. This sampling pro

264.97(g)(1) A sequence of at least four samples, taken at an interval that assures, to the greatest extent technically fe independent sample is obtained, by reference to the uppermost aquifer's effective porosity, hydraulic conductivity, and and the fate and transport characteristics of the potential contaminants, or

264.97(g)(2) an alternate sampling procedure proposed by the owner or operator and approved by the Regional Admir

264.97(h) The owner or operator will specify one of the following statistical methods to be used in evaluating ground-water mor hazardous constituent which, upon approval by the Regional Administrator, will be specified in the unit permit. The statistical te conducted separately for each hazardous constituent in each well. Where practical quantification limits (pql's) are used in any c procedures to comply with °264.97 (i)(5), the pql must be proposed by the owner or operator and approved by the Regional Adr the following statistical methods must be protective of human health
and the environment and must comply with the performance standards outlined in paragraph (i) of this section.

264.97(h)(1) A parametric analysis of variance (ANOVA) followed by multiple comparisons procedures to identify stati evidence of contamination. The method must include estimation and testing of the contrasts between each compliance background mean levels for each constituent.

264.97(h)(2) An analysis of variance (ANOVA) based on ranks followed by multiple comparisons procedures to identif significant evidence of contamination. The method must include estimation and testing of the contrasts between each median and the background median levels for each constituent.

264.97(h)(3) A tolerance or prediction interval procedure in which an interval for each constituent is established from t background data, and the level of each constituent in each compliance well is compared to the upper tolerance or prec

264.97(h)(4) A control chart approach that gives control limits for each constituent.

264.97(h)(5) Another statistical test method submitted by the owner or operator and approved by the Regional Admini

264.97(i) Any statistical method chosen under °264.97 (h) for specification in the unit permit shall comply with the following per appropriate:

264.97(i)(1) The statistical method used to evaluate ground-water monitoring data shall be appropriate for the distribu parameters or hazardous constituents. If the distribution of the chemical parameters or hazardous constituents is shov operator to be inappropriate for a normal theory test, then the data should be transformed or a distribution-free theory the distributions for the constituents differ, more than one statistical method may be needed.

264.97(i)(2) If an individual well comparison procedure is used to compare an individual compliance well constituent c background constituent concentrations or a ground-water protection standard, the test shall be done at a Type I error l for each testing period. If a multiple comparisons procedure is used, the Type I experimentwise error rate for each test less than 0.05; however, the Type I error of no less than 0.01 for individual well comparisons must be maintained. This standard does not apply to tolerance intervals, prediction intervals or control charts.

264.97(i)(3) If a control chart approach is used to evaluate ground-water monitoring data, the specific type of control c

parameter values shall be proposed by the owner or operator and approved by the Regional Administrator if he or she protective of human health and the environment.

264.97(i)(4) If a tolerance interval or a prediction interval is used to evaluate groundwater monitoring data, the levels c tolerance intervals, the percentage of the population that the interval must contain, shall be proposed by the owner or by the Regional Administrator if he or she finds these parameters to be protective of human health and the environme will be determined after considering the number of samples in the background data base, the data distribution, and the concentration values for each constituent of concern.

264.97(i)(5) The statistical method shall account for data below the limit of detection with one or more statistical proce protective of human health and the environment. Any practical quantification limit (pql) approved by the Regional Adm °264.97 (h) that is used in the statistical method shall be the lowest concentration level tha can be reliably achieved wi precision and accuracy during routine laboratory operating conditions that are available to the facility.

264.97(i)(6) If necessary, the statistical method shall include procedures to control or correct for seasonal and spatial temporal correlation in the data.

264.97(j) Ground-water monitoring data collected in accordance with paragraph (g) of this section including actual levels of cor maintained in the facility operating record. The Regional Administrator will specify in the permit when the data must be submitt

[47 FR 32350, July 26, 1982, as amended at 50 FR 4514, Jan. 31, 1985; 53 FR 39728, Oct. 11, 1988]

264.98 Detection monitoring program. An owner or operator required to establish a detection monitoring program under this must, at a minimum, discharge the following responsibilities:

264.98(a) The owner or operator must monitor for indicator parameters (e.g., specific conductance, total organic carbon, or tota waste constituents, or reaction products that provide a reliable indication of the presence of hazardous constituents in ground w Administrator will specify the parameters or constituents to be monitored in the facility permit, after considering the following fa

264.98(a)(1) The types, quantities, and concentrations of constituents in wastes managed at the regulated unit;

264.98(a)(2) The mobility, stability, and persistance of waste constituents or their reaction products in the unsaturated waste management area;

264.98(a)(3) The detectability of indicator parameters, waste constituents, and reaction products in ground water; and

264.98(a)(4) The concentrations or values and coefficients of variation of proposed monitoring parameters or constitue ground-water background.

264.98(b) The owner or operator must install a ground-water monitoring system at the compliance point as specified under °26 monitoring system must comply with °264.97 (a)(2), (b), and (c).

264.98(c) The owner or operator must conduct a ground-water monitoring program for each chemical parameter and hazardou the permit pursuant to paragraph (a) of this section in accordance with °264.97 (g). The owner or operator must maintain a rec analytical data as measured and in a form necessary for the determination of statistical significance under °264.97 (h).

264.98(d) The Regional Administrator will specify the frequencies for collecting samples and conducting statistical tests to dete statistically significant evidence of contamination for any parameter or hazardous constituent specified in the permit under para in accordance with °264.97 (g). A sequence of at least four samples from each well (background and compliance wells) must b semi-annually during detection monitoring.

264.98(e) The owner or operator must determine the ground-water flow rate and direction in the uppermost aquifer at least ann

264.98(f) The owner or operator must determine whether there is statistically significant evidence of contamination for any cher hazardous constituent specified in the permit pursuant to paragraph (a) of this section at a frequency specified under paragrapl

264.98(f)(1) In determining whether statistically significant evidence of contamination exists, the owner or operator mu specified in the permit under °264.97 (h). These method(s) must compare data collected at the compliance point(s) to ground-water quality data.

264.98(f)(2) The owner or operator must determine whether there is statistically significant evidence of contamination well as the compliance point within a reasonable period of time after completion of sampling. The Regional Administra

facility permit what period of time is reasonable, after considering the complexity of the statistical test and the availabi facilities to perform the analysis of ground-water samples.

264.98(g) If the owner or operator determines pursuant to paragraph (f) of this section that there is statistically significant evide chemical parameters or hazardous constituents specified pursuant to paragraph (a) of this section at any monitoring well at the she must:

264.98(g)(1) Notify the Regional Administrator of this finding in writing within seven days. The notification must indica parameters or hazardous constituents have shown statistically significant evidence of contamination;

264.98(g)(2) Immediately sample the ground water in all monitoring wells and determine whether constituents in the li part 264 are present, and if so, in what concentration.

264.98(g)(3) For any appendix IX compounds found in the analysis pursuant to paragraph (g)(2) of this section, the ov resample within one month and repeat the analysis for those compounds detected. If the results of the second analysi results, then these constituents will form the basis for compliance monitoring. If the owner or operator does not resam compounds found pursuant to paragraph (g)(2) of this section, the hazardous constituents found during this initial app form the basis for compliance monitoring.

264.98(g)(4) Within 90 days, submit to the Regional Administrator an application for a permit modification to establish monitoring program meeting the requirements of °264.99. The application must include the following information:

264.98(g)(4)(i) An identification of the concentration or any appendix IX constituent detected in the ground wa monitoring well at the compliance point;
264.98(g)(4)(ii) Any proposed changes to the ground-water monitoring system at the facility necessary to me of °264.99;
264.98(g)(4)(iii) Any proposed additions or changes to the monitoring frequency, sampling and analysis proc or statistical methods used at the facility necessary to meet the requirements of °264.99;
264.98(g)(4)(iv) For each hazardous constituent detected at the compliance point, a proposed concentration l (a) (1) or (2), or a notice of intent to seek an alternate concentration limit under °264.94 (b); and

264.98(g)(5) Within 180 days, submit to the Regional Administrator:

264.98(g)(5)(i) All data necessary to justify an alternate concentration limit sought under °264.94 (b); and
264.98(g)(5)(ii) An engineering feasibility plan for a corrective action program necessary to meet the requiren unless:

264.98(g)(5)(ii)(A) All hazardous constituents identified under paragraph (g)(2) of this section are lis °264.94 and their concentrations do not exceed the respective values given in that Table; or
264.98(g)(5)(ii)(B)The owner or operator has sought an alternate concentration limit under °264.94 (hazardous constituent identified under paragraph (g)(2) of this section.

264.98(g)(6) If the owner or operator determines, pursuant to paragraph (f) of this section, that there is a statistically s for chemical parameters or hazardous constituents specified pursuant to paragraph (a) of this section at any monitorir compliance point, he or she may demonstrate that a source other than a regulated unit caused the contamination or th artifact caused by an error in sampling, analysis, or statistical evaluation or natural variation in the ground water. The make a demonstration under this paragraph in addition to, or in lieu of, submitting a permit modification application ur of this section; however, the owner or operator is not relieved of the requirement to submit a permit modification applic specified in paragraph (g)(4) of this section unless the demonstration made under this paragraph successfully shows t than a regulated unit caused the increase, or that the increase resulted from error in sampling, analysis, or evaluation. demonstration under this paragraph, the owner or operator must:

264.98(g)(6)(i) Notify the Regional Administrator in writing within seven days of determining statistically signi contamination at the compliance point that he intends to make a demonstration under this paragraph;
264.98(g)(6)(ii) Within 90 days, submit a report to the Regional Administrator which demonstrates that a sou regulated unit caused the contamination or that the contamination resulted from error in sampling, analysis, c
264.98(g)(6)(iii) Within 90 days, submit to the Regional Administrator an application for a permit modificatior appropriate changes to the detection monitoring program facility; and
264.98(g)(6)(iv) Continue to monitor in accordance with the detection monitoring program established under :

264.98(h) If the owner or operator determines that the detection monitoring program no longer satisfies the requirements of this must, within 90 days, submit an application for a permit modification to make any appropriate changes to the program.

[47 FR 32350, July 26, 1982, as amended at 50 FR 4514, Jan. 31, 1985; 52 FR 25946, July 9, 1987; 53 FR 39729, Oct. 11, 19

264.99 Compliance monitoring program. An owner or operator required to establish a compliance monitoring program unde subpart must, at a minimum, discharge the following responsibilities:

264.99(a) The owner or operator must monitor the ground water to determine whether regulated units are in compliance with th protection standard under °264.92. The Regional Administrator will specify the ground-water protection standard in the facility p

264.99(a)(1) A list of the hazardous constituents identified under °264.93;

264.99(a)(2) Concentration limits under °264.94 for each of those hazardous constituents;

264.99(a)(3) The compliance point under °264.95; and

264.99(a)(4) The compliance period under °264.96.

264.99(b) The owner or operator must install a ground-water monitoring system at the compliance point as specified under °26 monitoring system must comply with °264.97 (a)(2), (b), and (c).

264.99(c) The Regional Administrator will specify the sampling procedures and statistical methods appropriate for the constitue consistent with °264.97 (g) and (h).

264.99(c)(1) The owner or operator must conduct a sampling program for each chemical parameter or hazardous con with °264.97 (g).

264.99(c)(2) The owner or operator must record ground-water analytical data as measured and in form necessary for statistical significance under °264.97 (h) for the compliance period of the facility.

264.99(d) The owner or operator must determine whether there is statistically significant evidence of increased contamination f parameter or hazardous constituent specified in the permit, pursuant to paragraph (a) of this section, at a frequency specified u this section.

264.99(d)(1) In determining whether statistically significant evidence of increased contamination exists, the owner or c method(s) specified in the permit under °264.97 (h). The methods(s) must compare data collected at the compliance p concentration limit developed in accordance with °264.94.

264.99(d)(2) The owner or operator must determine whether there is statistically significant evidence of increased con monitoring well at the compliance point within a reasonable time period after completion of sampling. The Regional Ac specify that time period in the facility permit, after considering the complexity of the statistical test and the availability to perform the analysis of ground-water samples.

264.99(e) The owner or operator must determine the ground-water flow rate and direction in the uppermost aquifer at least ann

264.99(f) The Regional Administrator will specify the frequencies for collecting samples and conducting statistical tests to deter significant evidence of increased contamination in accordance with °264.97 (g). A sequence of at least four samples from each compliance wells) must be collected at least semi-annually during the compliance period of the facility.

264.99(g) The owner or operator must analyze samples from all monitoring wells at the compliance point for all constituents co part 264 at least annually to determine whether additional hazardous constituents are present in the uppermost aquifer and, if s pursuant to procedures in °264.98 (f). If the owner or operator finds appendix IX constituents in the ground water that are not al permit as monitoring constituents, the owner or operator may resample within one month and repeat the appendix IX analysis. confirms the presence of new constituents, the owner or operator must report the concentration of these additional constituents Administrator within seven days after the completion of the second analysis and add them to the monitoring list. If the owner or resample, then he or she must report the concentrations of these additional constituents to the Regional Administrator within se completion of the intiial analysis and add them to the monitoring list.

264.99(h) If the owner or operator determines pursuant to paragraph (d) of this section that any concentration limits under °264 at any monitoring well at the point of compliance he or she must:

264.99(h)(1) Notify the Regional Administrator of this finding in writing within seven days. The notification must indica limits have been exceeded.

264.99(h)(2) Submit to the Regional Administrator an application for a permit modification to establish a corrective ac the requirements of °264.100 within 180 days, or within 90 days if an engineering feasibility study has been previously Regional Administrator under °264.98 (h)(5). The application must at a minimum include the following information:

264.99(h)(2)(i) A detailed description of corrective actions that will achieve compliance with the ground-water standard specified in the permit under paragraph (a) of this section; and
264.99(h)(2)(ii) A plan for a ground-water monitoring program that will demonstrate the effectiveness of the c Such a ground-water monitoring program may be based on a compliance monitoring program developed to r requirements of this section.

264.99(i) If the owner or operator determines, pursuant to paragraph (d) of this section, that the ground-water concentration lim being exceeded at any monitoring well at the point of compliance, he or she may demonstrate that a source other than a regula contamination or that the detection is an artifact caused by an error in sampling, analysis, or statistical evaluation or natural va water. In making a demonstration under this paragraph, the owner or operator must:

264.99(i)(1) Notify the Regional Administrator in writing within seven days that he intends to make a demonstration un

264.99(i)(2) Within 90 days, submit a report to the Regional Administrator which demonstrates that a source other tha caused the standard to be exceeded or that the apparent noncompliance with the standards resulted from error in sam evaluation;

264.99(i)(3) Within 90 days, submit to the Regional Administrator an application for a permit modification to make an to the compliance monitoring program at the facility; and

264.99(i)(4) Continue to monitor in accord with the compliance monitoring program established under this section.

264.99(j) If the owner or operator determines that the compliance monitoring program no longer satisfies the requirements of th within 90 days, submit an application for a permit modification to make any appropriate changes to the program.

[47 FR 32350, July 26, 1982, as amended at 50 FR 4514, Jan. 31, 1985; 52 FR 25946, July 9, 1987; 53 FR 39730, Oct. 11, 19

264.100 Corrective action program. An owner or operator required to establish a corrective action program under this subpa minimum, discharge the following responsibilities:

264.100(a) The owner or operator must take corrective action to ensure that regulated units are in compliance with the ground- standard under °264.92. The Regional Administrator will specify the ground-water protection standard in the facility permit, incl

264.100(a)(1) A list of the hazardous constituents identified under °264.93;

264.100(a)(2) Concentration limits under °264.94 for each of those hazardous constituents;

264.100(a)(3) The compliance point under °264.95; and

264.100(a)(4) The compliance period under °264.96.

264.100(b) The owner or operator must implement a corrective action program that prevents hazardous constituents from exce concentration limits at the compliance point by removing the hazardous waste constituents or treating them in place. The perm measures that will be taken.

264.100(c) The owner or operator must begin corrective action within a reasonable time period after the ground-water protectio The Regional Administrator will specify that time period in the facility permit. If a facility permit includes a corrective action pro compliance monitoring program, the permit will specify when the corrective action will begin and such a requirement will operat (i)(2).

264.100(d) In conjunction with a corrective action program, the owner or operator must establish and implement a ground-wat demonstrate the effectiveness of the corrective action program. Such a monitoring program may be based on the requirements monitoring program under °264.99 and must be as effective as that program in determining compliance with the ground-water under °264.92 and in determining the success of a corrective action program under paragraph (e) of this section, where approp

264.100(e) In addition to the other requirements of this section, the owner or operator must conduct a corrective action progran place any hazardous constituents under °264.93 that exceed concentration limits under °264.94 in groundwater:

264.100(e)(1) Between the compliance point under °264.95 and the downgradient property boundary; and

264.100(e)(2) Beyond the facility boundary, where necessary to protect human health and the environment, unless the demonstrates to the satisfaction of the Regional Administrator that, despite the owner's or operator's best efforts, the c unable to obtain the necessary permission to undertake such action. The owner/operator is not relieved of all responsi release that has migrated beyond the facility boundary where off-site access is denied. On-site measures to address s determined on a case-by-case basis.

264.100(e)(3) Corrective action measures under this paragraph must be initiated and completed within a reasonable p considering the extent of contamination.

264.100(e)(4) Corrective action measures under this paragraph may be terminated once the concentration of hazardo °264.93 is reduced to levels below their respective concentration limits under °264.94.

264.100(f) The owner or operator must continue corrective action measures during the compliance period to the extent necessa ground-water protection standard is not exceeded. If the owner or operator is conducting corrective action at the end of the com continue that corrective action for as long as necessary to achieve compliance with the ground-water protection standard. The terminate corrective action measures taken beyond the period equal to the active life of the waste management area (including can demonstrate, based on data from the ground-water monitoring program under paragraph (d) of this section, that the groun standard of °264.92 has not been exceeded for a period of three consecutive years.

264.100(g) The owner or operator must report in writing to the Regional Administrator on the effectiveness of the corrective act or operator must submit these reports semi-annually.

264.100(h) If the owner or operator determines that the corrective action program no longer satisfies the requirements of this s 90 days, submit an application for a permit modification to make any appropriate changes to the program.

[47 FR 32350, July 26, 1985, as amended at 50 FR 4514, Jan. 31, 1985; 52 FR 45798, Dec. 1, 1987]

264.101 Corrective action for solid waste management units.

264.101(a) The owner or operator of a facility seeking a permit for the treatment, storage or disposal of hazardous waste must as necessary to protect human health and the environment for all releases of hazardous waste or constituents from any solid w the facility, regardless of the time at which waste was placed in such unit.

264.101(b) Corrective action will be specified in the permit in accordance with this section and subpart S of this part. The perm of compliance for such corrective action (where such corrective action cannot be completed prior to issuance of the permit) anc responsibility for completing such corrective action.

264.101(c) The owner or operator must implement corrective actions beyond the facility property boundary, where necessary tc and the environment, unless the owner or operator demonstrates to the satisfaction of the Regional Administrator that, despite best efforts, the owner or operator was unable to obtain the necessary permission to undertake such actions. The owner/operat responsibility to clean up a release that has migrated beyond the facility boundary where off-site access is denied. On-site mea releases will be determined on a case-by-case basis. Assurances of financial responsibility for such corrective action must be p

[50 FR 28747, July 15, 1985, as amended at 52 FR 45798, Dec. 1, 1987; 58 FR 8658, Feb. 16, 1993] Source: 51 FR 16444, I otherwise noted.

Appendix B

Phase II Environmental Assessment Report, 1996

STANLEY ENVIRONMENTAL, INC.

The University of Iowa Oakdale Research Park • 2656 Crosspark Road • Coralville, IA 52241 Tel: 319/626-3990 • Fax: 319/626-3993

September 13, 1996

Mr. John E. Tyrrell
Hawkeye Castings, Inc.
10077 South 3rd Street
P.O. Box 70
Manchester, IA 52057-0070

Dear John:

Subject: Phase 2 Environmental Site Assessment Services
Hawkeye Castings, Inc. Facility
Manchester, Iowa

In accordance with our agreement, we are submitting this report summarizing the results of a limited Phase 2 Environmental Site Assessment at the Hawkeye Castings Facility in Manchester, Iowa. Included in the report are a description of the sampling and analysis activities performed, the results of the analysis, and recommendations for additional activities. Field work was performed on August 23, 1996.

Field Activities

1. Six shallow borings varying in depth from 5 to 10 feet were performed west of the foundry building at the locations shown on the enclosed figure.

2. One sample of waste foundry sand was collected from each boring. Temporary groundwater monitoring wells were installed in three of the borings.

3. A portion of each sand sample was utilized to prepare a composite waste sample for laboratory analysis. The remainder of the sand samples were retained for future analysis. The composite sample was analyzed for total and TCLP metals (RCRA list plus copper, nickel, and zinc) and phenols.

4. Following receipt of the analysis of the composite sample, the individual waste sand samples were analyzed for total and TCLP lead.

5. Water samples from the wells and the creek which flows along the southerly boundary of the Hawkeye site were analyzed for dissolved metals (RCRA list plus copper, nickel, and zinc), and phenols.

6. Borings and wells were abandoned using bentonite chips. Drill cuttings were left on site at the boring locations.

Borings were advanced using a hollow stem auger drill rig with a five foot long continuous soil sampler. The soil profile at each of the boring locations consisted of approximately six to twelve inches of silty clay overlying 1 to 2 feet of waste foundry sand. Beneath the waste foundry sand was a native soil layer consisting of a moist, gray to brown medium sand. Groundwater was encountered at depths varying from approximately 4 feet to approximately 7 feet. Wells were constructed of a 10 foot length of No. 10 PVC well screen, which was installed through the hollow stem augers. The formation caved to the water table and, accordingly, no sand pack was installed around the screens. The well screens were pulled after use and the borings sealed with bentonite chips.

Waste foundry sand samples were collected from each boring and placed in 4 ounce glass jars with Teflon-lined lids. Water samples for metals analysis were collected in 1 liter plastic jars. Phenols samples were collected in 1 quart brown glass jars. Samples were chilled to 4°C, sealed in a cooler, and shipped to NET Midwest in Cedar Falls, Iowa for analysis. Water samples were filtered at the laboratory prior to metals analysis and then preserved with nitric acid. Laboratory reports and documentation of sample chain of custody are attached.

Results

The results of the analysis indicate the waste foundry sand at four of the six boring locations exhibits the hazardous waste characteristic of TCLP Toxicity for lead. The regulatory threshold for this determination is 5 mg/L in the sample extract. Sample extract values varied from 0.54 mg/L in boring 1 to 7.5 mg/L in boring 5, with an average value of 5.2 mg/L. The waste sand did not exhibit any other hazardous waste characteristics and, except for a somewhat elevated level of copper in the waste, did not appear to pose any other significant environmental concerns. The copper level observed in the waste sand falls into the range considered acceptable by USEPA for industrial property. Analytical results for the water samples did not indicate significant concerns. All sampling locations are shown on the attached figure.

Conclusions

The results of the analysis indicate that the waste foundry sand disposed at the Hawkeye Castings site must be considered a hazardous waste. The RCRA designation for the waste would be D008 and the waste would most likely be considered by USEPA to be in storage. The waste is not currently being managed in accordance with 40 CFR 265, the USEPA requirements for Interim

Status hazardous waste treatment, storage, and disposal facilities. These rules require that USEPA be notified of the existence of the storage unit and that the unit either be brought into compliance or closed. Closure would likely include removal of the waste to a permitted facility and additional analysis to verify no hazardous waste remains on site. Treatment of the material in place may also be an option, although approval from USEPA would be required for that, as well. In any case, USEPA should be notified of the existence of your facility.

We are available to provide assistance, if you wish. If you have any questions, please feel free to call.

Sincerely,

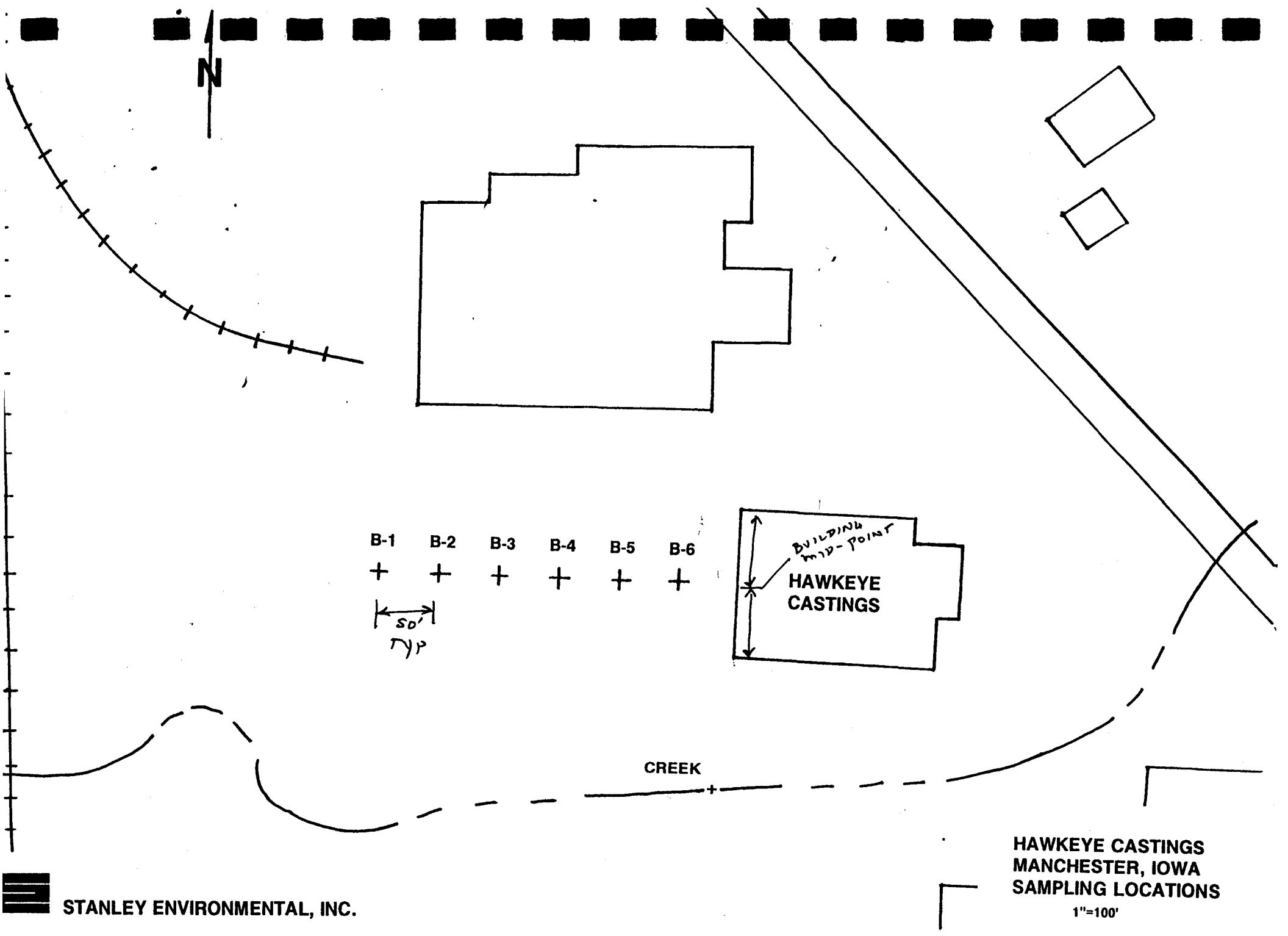
STANLEY ENVIRONMENTAL, INC.

H. Scott Byram, P.E., DEE
Principal Environmental Engineer

Attachments

cc: File

hsb:bib:50091:50091.esa



STANLEY ENVIRONMENTAL, INC.

HAWKEYE CASTINGS
MANCHESTER, IOWA
SAMPLING LOCATIONS
1"=100'

NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

ANALYTICAL REPORT

Scott Byram
STANLEY ENVIRONMENTAL
U of I Oakdale Res. Park
2656 Cross Park Road
Coralville, IA 52241

08/29/1996

NET Job Number: 96.10636

NET Sample Number: 362476

Sample ID: #1 Sand Composite - Hawkeye Castings

Date Taken: 08/23/1996

Date Received: 08/24/1996

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit
Solid pH Measured in Water	7.7	units		jas	08/26/1996	S-9045	0.1
Phenols, total	0.58	mg/kg		cjh	08/28/1996	E-420.1	0.50
Solids, Total	94.43	%		jas	08/28/1996	SM 2540 G	0.01
Mercury,CVAA	0.038	mg/kg	MSO	kyd	08/28/1996	E-245.5	0.020
ICP Metals Prep (Solid)	Complete	g		kyd	08/26/1996		
ICP Metals-Solid	Complete	mg/kg	IE	lmc	08/27/1996	S-6010A	
Arsenic, ICP	<16	mg/kg		lmc	08/27/1996	S-6010A	4.0
Barium, ICP	9.5	mg/kg		lmc	08/27/1996	S-6010A	0.50
Cadmium, ICP	<4.0	mg/kg		lmc	08/27/1996	S-6010A	1.0
Chromium, ICP	31	mg/kg		lmc	08/27/1996	S-6010A	1.0
Copper, ICP	4,400	mg/kg		lmc	08/27/1996	S-6010A	1.0
Lead, ICP	600	mg/kg		lmc	08/27/1996	S-6010A	5.0
Nickel, ICP	360	mg/kg		lmc	08/27/1996	S-6010A	2.5
Selenium, ICP	<30	mg/kg		lmc	08/27/1996	S-6010A	7.5
Silver, ICP	<4.0	mg/kg		lmc	08/27/1996	S-6010A	1.0
Zinc, ICP	1,100	mg/kg	MSOM	lmc	08/27/1996	S-6010A	1.0
TCLP - Mercury	<0.0020	mg/L		kyd	08/28/1996	S-7470	0.0020
ICP TCLP METALS							
TCLP Arsenic (ICP)	<0.080	mg/L		lmc	08/27/1996	S-6010A	0.080
TCLP Barium (ICP)	0.464	mg/L		lmc	08/27/1996	S-6010A	0.010
TCLP Cadmium (ICP)	<0.020	mg/L		lmc	08/27/1996	S-6010A	0.020

Key to flags:

NOTE: Elevated Reporting Limit due to interelement interference.
M - Duplicate (or MS/MSD) RPD is greater than 20%
MSO - MS and/or MSD are out of control for this analyte

Kristin Voigts for
Cheryl L. Wilson
Operations Manager

NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

ANALYTICAL REPORT

Scott Byram
STANLEY ENVIRONMENTAL
U of I Oakdale Res. Park
2656 Cross Park Road
Coralville, IA 52241

08/29/1996

NET Job Number: 96.10636

NET Sample Number: 362476

Sample ID: #1 Sand Composite Hawkeye Castings

Date Taken: 08/23/1996

Date Received: 08/24/1996

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit
TCLP Chromium (ICP)	<0.020	mg/L		lmc	08/27/1996	S-6010A	0.020
TCLP Copper (ICP)	56	mg/L		lmc	08/27/1996	S-6010A	0.020
TCLP Lead (ICP)	4.2	mg/L		lmc	08/27/1996	S-6010A	0.10
TCLP Nickel (ICP)	0.241	mg/L		lmc	08/27/1996	S-6010A	0.050
TCLP Selenium (ICP)	<0.15	mg/L	L	lmc	08/27/1996	S-6010A	0.15
TCLP Silver (ICP)	<0.010	mg/L		lmc	08/27/1996	S-6010A	0.010
TCLP Zinc (ICP)	13	mg/L	W	lmc	08/27/1996	S-6010A	0.020

Key to flags:

L - LCS is out of control for this analyte's prep batch
W - Post digestion spike is out of control limits for this analyte

Kristin Voigts for
Cheryl L. Wilson
Operations Manager

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ANALYTICAL REPORT

Scott Byram
STANLEY ENVIRONMENTAL
U of I Oakdale Res. Park
2656 Cross Park Road
Coralville, IA 52241

08/29/1996

NET Job Number: 96.10636

NET Sample Number: 362477

Sample ID: B-1 Hawkeye Castings

Date Taken: 08/23/1996

Date Received: 08/24/1996

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit
Phenols, Total	<0.020	mg/L		cjh	08/28/1996	E-420.1	0.020
Arsenic, Dissolved (ICP)	<0.080	mg/L		lmc	08/27/1996	S-6010A	0.080
Barium, Dissolved (ICP)	0.068	mg/L		lmc	08/27/1996	S-6010A	0.010
Cadmium, Dissolved (ICP)	<0.020	mg/L		lmc	08/27/1996	S-6010A	0.020
Chromium, Dissolved (ICP)	<0.020	mg/L		lmc	08/27/1996	S-6010A	0.020
Copper, Dissolved (ICP)	<0.020	mg/L		lmc	08/27/1996	S-6010A	0.020
Lead, Dissolved (ICP)	<0.10	mg/L		lmc	08/27/1996	S-6010A	0.10
Nickel, Dissolved (ICP)	<0.050	mg/L		lmc	08/27/1996	S-6010A	0.050
Selenium, Dissolved (ICP)	<0.15	mg/L		lmc	08/27/1996	S-6010A	0.15
Silver, Dissolved (ICP)	<0.010	mg/L		lmc	08/27/1996	S-6010A	0.010
Zinc, Dissolved (ICP)	<0.020	mg/L		lmc	08/27/1996	S-6010A	0.020
Mercury, diss. Cold Vapor	<0.00020	mg/L		kyd	08/28/1996	E-245.1	0.0002

Key to flags:

Kristin Voigts
Cheryl L. Wilson for
Operations Manager

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ANALYTICAL REPORT

Scott Byram
STANLEY ENVIRONMENTAL
U of I Oakdale Res. Park
2656 Cross Park Road
Coralville, IA 52241

08/29/1996

NET Job Number: 96.10636

NET Sample Number: 362478

Sample ID: B-4 Hawkeye Castings

Date Taken: 08/23/1996

Date Received: 08/24/1996

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit
Phenols, Total	<0.020	mg/L		cjh	08/28/1996	E-420.1	0.020
Arsenic, Dissolved (ICP)	<0.080	mg/L		lmc	08/27/1996	S-6010A	0.080
Barium, Dissolved (ICP)	0.047	mg/L		lmc	08/27/1996	S-6010A	0.010
Cadmium, Dissolved (ICP)	<0.020	mg/L		lmc	08/27/1996	S-6010A	0.020
Chromium, Dissolved (ICP)	<0.020	mg/L		lmc	08/27/1996	S-6010A	0.020
Copper, Dissolved (ICP)	<0.020	mg/L		lmc	08/27/1996	S-6010A	0.020
Lead, Dissolved (ICP)	<0.10	mg/L		lmc	08/27/1996	S-6010A	0.10
Nickel, Dissolved (ICP)	<0.050	mg/L		lmc	08/27/1996	S-6010A	0.050
Selenium, Dissolved (ICP)	<0.15	mg/L		lmc	08/27/1996	S-6010A	0.15
Silver, Dissolved (ICP)	<0.010	mg/L		lmc	08/27/1996	S-6010A	0.010
Zinc, Dissolved (ICP)	0.030	mg/L		lmc	08/27/1996	S-6010A	0.020
Mercury, diss. Cold Vapor	<0.00020	mg/L		kyd	08/28/1996	E-245.1	0.0002

Key to flags:

Kristin Voigts for

Cheryl L. Wilson
Operations Manager

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ANALYTICAL REPORT

Scott Byram
STANLEY ENVIRONMENTAL
U of I Oakdale Res. Park
2656 Cross Park Road
Coralville, IA 52241

08/29/1996

NET Job Number: 96.10636

NET Sample Number: 362479

Sample ID: B-6 Hawkeye Castings

Date Taken: 08/23/1996

Date Received: 08/24/1996

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit
Phenols, Total	<0.020	mg/L		cjh	08/28/1996	E-420.1	0.020
Arsenic, Dissolved (ICP)	<0.080	mg/L		lmc	08/27/1996	S-6010A	0.080
Barium, Dissolved (ICP)	0.198	mg/L		lmc	08/27/1996	S-6010A	0.010
Cadmium, Dissolved (ICP)	<0.020	mg/L		lmc	08/27/1996	S-6010A	0.020
Chromium, Dissolved (ICP)	<0.020	mg/L		lmc	08/27/1996	S-6010A	0.020
Copper, Dissolved (ICP)	0.024	mg/L		lmc	08/27/1996	S-6010A	0.020
Lead, Dissolved (ICP)	<0.10	mg/L		lmc	08/27/1996	S-6010A	0.10
Nickel, Dissolved (ICP)	<0.050	mg/L		lmc	08/27/1996	S-6010A	0.050
Selenium, Dissolved (ICP)	<0.15	mg/L		lmc	08/27/1996	S-6010A	0.15
Silver, Dissolved (ICP)	<0.010	mg/L		lmc	08/27/1996	S-6010A	0.010
Zinc, Dissolved (ICP)	<0.020	mg/L	W	lmc	08/27/1996	S-6010A	0.020
Mercury, diss. Cold Vapor	<0.00020	mg/L		kyd	08/28/1996	E-245.1	0.0002

Key to flags:

W - Post digestion spike is out of control limits for this analyte

Kristin Voigts for
Cheryl L. Wilson
Operations Manager

NATIONAL ENVIRONMENTAL TESTING, INC.

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ANALYTICAL REPORT

Scott Byram
STANLEY ENVIRONMENTAL
U of I Oakdale Res. Park
2656 Cross Park Road
Coralville, IA 52241

08/29/1996

NET Job Number: 96.10636

NET Sample Number: 362480

Sample ID: Creek Hawkeye Castings

Date Taken: 08/23/1996

Date Received: 08/24/1996

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit
Phenols, Total	<0.020	mg/L		cjh	08/28/1996	E-420.1	0.020
ICP Metals - E 200.7	COMPLETE	mg/L		lmc	08/28/1996		
Arsenic, ICP	<0.080	mg/L		lmc	08/28/1996	E-200.7	0.080
Barium, ICP	0.076	mg/L		lmc	08/28/1996	E-200.7	0.010
Cadmium, ICP	<0.020	mg/L		lmc	08/28/1996	E-200.7	0.020
Chromium, ICP	<0.020	mg/L		lmc	08/28/1996	E-200.7	0.020
Copper, ICP	0.020	mg/L		lmc	08/28/1996	E-200.7	0.020
Lead, ICP	<0.10	mg/L		lmc	08/28/1996	E-200.7	0.10
Nickel, ICP	<0.050	mg/L		lmc	08/28/1996	E-200.7	0.050
Selenium, ICP	<0.15	mg/L		lmc	08/28/1996	E-200.7	0.15
Silver, ICP	<0.010	mg/L		lmc	08/28/1996	E-200.7	0.010
Zinc, ICP	<0.020	mg/L		lmc	08/28/1996	E-200.7	0.020
Mercury,Cold Vapor	<0.00020	mg/L		kyd	08/28/1996	E-245.1	0.0002

Key to flags:

Kristin Voigts for
Cheryl L. Wilson
Operations Manager

NET [redacted] ENVIRONMENTAL TESTING, INC.

[redacted] T, In[redacted] Ceda[redacted]s Di[redacted]n
704 Enterprise Drive
Cedar Falls, IA 50613

Pho[redacted] 319[redacted]7 - 2[redacted] or [redacted]800 - [redacted] - 24[redacted]
FAX 319 - 277 - 2425

Company: STANLEY ENVIRONMENTAL
Send Report To: SCOTT BYRAM
Address: 2656 CROSSPARK RD
City/State/Zip Code: CORALVILLE, IOWA 52241
Telephone Number: 319 626 3990 Fax: 626 3993

Sampled By: (Print Name) SCOTT BYRAM
(Signature) Scott Byram

PO #:
Invoice to: SCOTT BYRAM @ STANLEY
NET Quote #:
Project Name: HAWKEYE CASINGS
Project Number:
Project Manager: SCOTT BYRAM

Sample ID	Date Sampled	Time Sampled	# of Containers Shipped	Grab	Composite	Field Filtered	Preservative: Ice	HNO3 (Red & White Label)	HCl (Blue & White Label)	NaOH (Orange & White Label)	H2SO4 (Yellow & White Label)	None (Black & White Label)	Other (Specify):	Matrix: Groundwater	Wastewater	Drinking Water	Sludge	Soil	Other (Specify):	Analyze for: TCLP METALS	TOTAL METALS	PHENOLS (TOT)	Results need: 48 HR TAT (SEE NOTE)	5 DAY TAT (SEE NOTE)	STANDARD TAT (10 DAYS)	Fax Results	Send QC Data with report
#1 - SAND COMPOSITE	8/23/96	NA	1		X		X					X						X		X	X	X	X			X	
#2 - B-1		1135	2	X			X					X								X	X	X					
#3 - B-4		1145	2	X			X					X								X	X	X					
#4 - B-6		1200	2	X			X					X								X	X	X					
#5 - CREEK		1205	2	X			X					X								X	X	X					

NOTE: All turn around times are calculated from the time of receipt at NET. NOTE: There may be a charge for NET disposing of sample

NOTE: PRE-ARRANGEMENTS MUST BE MADE AT LEAST 48 HOURS IN ADVANCE TO RECEIVE RESULTS WITH THESE TURN AROUND TIME COMMITMENTS. ADDITIONAL CHARGES MAY BE ASSESSED.

NOTES: METALS LIST = RCRA 8 PLUS Cu, Ni, Zn.
PLEASE FILTER SAMPLES
PLEASE RUSH ANALYSIS

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	DATE	TIME	DATE	TIME
Scott Byram	8/23/96	5:00P					
RECEIVED FOR NET BY:	**DATE**	**TIME**	**COC SEALS PRESENT AND INTACT? YES NO NA**		**SHIPPED VIA:**		
Donna Johnson	8/24/96	8:00	**TEMPERATURE UPON RECEIPT**		**ARE THESE SAMPLES FOR NPDES COMPLIANCE? YES NO**		

NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

ANALYTICAL REPORT

Scott Byram
STANLEY ENVIRONMENTAL
U of I Oakdale Res. Park
2656 Cross Park Road
Coralville, IA 52241

09/06/1996

Sample No.: 363142

NET Job No: 96.10889

Sample ID: #1 Hawkeye Castings

Date Taken: 08/23/1996 Date Received: 08/31/1996

	Result	Units	Date Analyzed	Analyst	Analysis Method
Solid pH Measured in Water	7.4	units	09/05/1996	jas	S-9045
Solids, Total	90.10	%	09/03/1996	mas	SM 2540 G
ICP Metals Prep (Solid)	Complete	g	09/03/1996	ajp	
ICP Metals-Solid	Complete	mg/kg	09/05/1996	lmc	S-6010A
Lead, ICP	870	mg/kg	09/05/1996	lmc	S-6010A
ICP TCLP METALS					
TCLP Lead (ICP)	0.54	mg/L	09/06/1996	lmc	S-6010A

Units: mg/L = ppm ug/g = mg/kg = ppm

Cheryl L. Wilson
Operations Manager

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
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ANALYTICAL REPORT

Scott Byram
STANLEY ENVIRONMENTAL
U of I Oakdale Res. Park
2656 Cross Park Road
Coralville, IA 52241

09/06/1996

Sample No.: 363143

NET Job No: 96.10889

Sample ID: #2 Hawkeye Castings

Date Taken: 08/23/1996 Date Received: 08/31/1996

	Result	Units	Date Analyzed	Analyst	Analysis Method
Solid pH Measured in Water	7.7	units	09/05/1996	jas	S-9045
Solids, Total	95.62	%	09/03/1996	mas	SM 2540 G
ICP Metals Prep (Solid)	Complete	g	09/03/1996	ajp	
ICP Metals-Solid	Complete	mg/kg	09/05/1996	lmc	S-6010A
Lead, ICP	580	mg/kg	09/05/1996	lmc	S-6010A
ICP TCLP METALS					
TCLP Lead (ICP)	7.3	mg/L	09/06/1996	lmc	S-6010A

Units: mg/L = ppm ug/g = mg/kg = ppm

Cheryl L. Wilson
Operations Manager

NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
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Fax: (319) 277-2425

ANALYTICAL REPORT

Scott Byram
STANLEY ENVIRONMENTAL
U of I Oakdale Res. Park
2656 Cross Park Road
Coralville, IA 52241

09/06/1996
Sample No.: 363144
NET Job No: 96.10889

Sample ID: #3 Hawkeye Castings

Date Taken: 08/23/1996 Date Received: 08/31/1996

	Result	Units	Date Analyzed	Analyst	Analysis Method
Solid pH Measured in Water	7.7	units	09/05/1996	jas	S-9045
Solids, Total	96.58	%	09/03/1996	mas	SM 2540 G
ICP Metals Prep (Solid)	Complete	g	09/03/1996	ajp	
ICP Metals-Solid	Complete	mg/kg	09/05/1996	lmc	S-6010A
Lead, ICP	480	mg/kg	09/05/1996	lmc	S-6010A
ICP TCLP METALS					
TCLP Lead (ICP)	6.4	mg/L	09/06/1996	lmc	S-6010A

Units: mg/L = ppm ug/g = mg/kg = ppm

Cheryl L. Wilson
Operations Manager

NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

ANALYTICAL REPORT

Scott Byram
STANLEY ENVIRONMENTAL
U of I Oakdale Res. Park
2656 Cross Park Road
Coralville, IA 52241

09/06/1996

Sample No.: 363145

NET Job No: 96.10889

Sample ID: #4 Hawkeye Castings

Date Taken: 08/23/1996 Date Received: 08/31/1996

	Result	Units	Date Analyzed	Analyst	Analysis Method
Solid pH Measured in Water	8.1	units	09/05/1996	jas	S-9045
Solids, Total	93.97	%	09/03/1996	mas	SM 2540 G
ICP Metals Prep (Solid)	Complete	g	09/03/1996	ajp	
ICP Metals-Solid	Complete	mg/kg	09/05/1996	lmc	S-6010A
Lead, ICP	510	mg/kg	09/05/1996	lmc	S-6010A
ICP TCLP METALS					
TCLP Lead (ICP)	6.3	mg/L	09/06/1996	lmc	S-6010A

Units: mg/L = ppm ug/g = mg/kg = ppm

Cheryl L. Wilson
Operations Manager

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ANALYTICAL REPORT

Scott Byram
STANLEY ENVIRONMENTAL
U of I Oakdale Res. Park
2656 Cross Park Road
Coralville, IA 52241

09/06/1996

Sample No.: 363146

NET Job No: 96.10889

Sample ID: #5 Hawkeye Castings

Date Taken: 08/23/1996 Date Received: 08/31/1996

	Result	Units	Date Analyzed	Analyst	Analysis Method
Solid pH Measured in Water	8.2	units	09/05/1996	jas	S-9045
Solids, Total	94.42	%	09/03/1996	mas	SM 2540 G
ICP Metals Prep (Solid)	Complete	g	09/03/1996	ajp	
ICP Metals-Solid	Complete	mg/kg	09/05/1996	lmc	S-6010A
Lead, ICP	510	mg/kg	09/05/1996	lmc	S-6010A
ICP TCLP METALS					
TCLP Lead (ICP)	7.5	mg/L	09/06/1996	lmc	S-6010A

Units: mg/L = ppm ug/g = mg/kg = ppm

Cheryl L. Wilson
Operations Manager

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ANALYTICAL REPORT

Scott Byram
STANLEY ENVIRONMENTAL
U of I Oakdale Res. Park
2656 Cross Park Road
Coralville, IA 52241

09/06/1996

Sample No.: 363147

NET Job No: 96.10889

Sample ID: #6 Hawkeye Castings

Date Taken: 08/23/1996 Date Received: 08/31/1996

	Result	Units	Date Analyzed	Analyst	Analysis Method
Solid pH Measured in Water	7.7	units	09/05/1996	jas	S-9045
Solids, Total	96.29	%	09/03/1996	mas	SM 2540 G
ICP Metals Prep (Solid)	Complete	g	09/03/1996	ajp	
ICP Metals-Solid	Complete	mg/kg	09/05/1996	lmc	S-6010A
Lead, ICP	490	mg/kg	09/05/1996	lmc	S-6010A
ICP TCLP METALS					
TCLP Lead (ICP)	3.2	mg/L	09/06/1996	lmc	S-6010A

Units: mg/L = ppm ug/g = mg/kg = ppm

Cheryl L. Wilson
Operations Manager

NET ENVIRONMENTAL TESTING, INC.

704 Enterprise Drive
Cedar Falls, IA 50613

FAX 319 - 277 - 2425

Company: STANLEY ENVIRONMENTAL
Send Report To: Scott Byram
Address: 2686 CROSSPARK RD
City/State/Zip Code: CORALVILLE, IOWA 52241
Telephone Number: 319 626 3990 Fax:
Sampled By: (Print Name) Scott Byram
(Signature) Scott Byram

PO #:
Invoice to:
NET Quote #:
Project Name: HAWKEYE CASTINGS
Project Number: SD091.01.00
Project Manager: Scott Byram

Sample ID	Date Sampled	Time Sampled	# of Containers Shipped	Grab	Composite	Field Filtered	Preservative: Ice	HNO3 (Red & White Label)	HCl (Blue & White Label)	NaOH (Orange & White Label)	H2SO4 (Yellow & White Label)	None (Black & White Label)	Other (Specify):	Matrix: Groundwater	Wastewater	Drinking Water	Sludge	Soil	Other (Specify):	Analyze for: TCLP - LEAD	TOTAL LEAD	Results need: 48 HR TAT (SEE NOTE)	5 DAY TAT (SEE NOTE)	STANDARD TAT (10 DAYS)	Fax Results	Send QC Data with report
#1	8/23/96	1005	1	X								X						X					X		X	
#2		1030	1	X								X						X					X		X	
#3		1038	1	X								X						X					X		X	
#4		1049	1	X								X						X					X		X	
#5		1100	1	X								X						X					X		X	
#6		1110	1	X								X						X					X		X	

NOTE: All turn around times are calculated from the time of receipt at NET.

NOTE: There may be a charge for NET disposing of sample

NOTE: PRE-ARRANGEMENTS MUST BE MADE AT LEAST 48 HOURS IN ADVANCE TO RECEIVE RESULTS WITH THESE TURN AROUND TIME COMMITMENTS. ADDITIONAL CHARGES MAY BE ASSESSED.

NOTES: THANKS FOR EXPEDITING ANALYSIS

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	DATE	TIME	DATE	TIME
Scott Byram	8/30/96	1005	A				
RECEIVED FOR NET BY:	DATE	TIME	COC SEALS PRESENT AND INTACT? YES NO NA	SHIPPED VIA:			
CA Robbins	8/31/96	800	TEMPERATURE UPON RECEIPT	ARE THESE SAMPLES FOR NPDES COMPLIANCE? YES NO			

Appendix C

Boring Logs and Well Construction Diagrams

SOIL BORING LOG AND MONITORING WELL CONSTRUCTION DIAGRAM

*Boring/Well Identification: S-6	UST Registration No.:	LUST No.:
**Boring Depth (ft) X Diameter (in): 3.5 x 4.5		Well Owner's Name: Hawkeye Casting
Start Date: 9-1-99	Finish Date: 9-1-99	Drilling Method: CC
Permanent Well: (N)	Temporary Well: (N)	Depth to Static Water Level: NA
Total Depth of Well: NA	Depth to Bedrock: NA	Top of Casing: NA
Drilling Company: AQUADRILL, INC.		Top of Screen: NA
Company Address CORALVILLE IOWA		City, State, Zip:
Certified Driller's Signature:		Logged by: CHEM-ECO (rtk)
Driller's Registration Number:		Date Logged:9-1-99

Depth (feet)	Well Construction Sketch	Sample No.	***Type	PID / FID Reading	Rock Formations, Soil, Color and Classifications, Observations (moisture, odor, etc.) First column for USCS
0.0'-0.4'	NA	6-1	CC	NA	BLACK SILT (TOP SOIL)
0.4'-1.4'	NA	6-2	CC	NA	BLACK FILL MIXED w/ FOUDARY SAND
1.4'-2.5'	NA	6-3	CC	NA	DARK BROWN SILTY SAND
2.5'-3.5'	NA	6-4	CC	NA	BROWN CLAYEY SAND

Examples of Observations (right column):

cement; rock; crushed gravel/fill material; black silt, loose, moist; sands, moist, brown, firm; sand, dark gray, moist, petroleum odor; clay, sandy, brown, dry; gravely sand, dry; silty sands, moist

* Example: MW-1 or SB-1

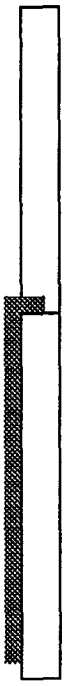
** Example: 15 feet X 7 inches

*** Hollow Stem Auger (HS), Split Spoon (SS), Continuous Core (CC)

SOIL BORING LOG AND MONITORING WELL CONSTRUCTION DIAGRAM

*Boring/Well Identification: S-7/TMW-1	UST Registration No.:	LUST No.:
**Boring Depth (ft) X Diameter (in): 10.5 x 6.25		Well Owner's Name: Hawkeye Casting
Start Date: 9-1-99	Finish Date: 9-1-99	Drilling Method: HS & CC
Permanent Well: (N)	Temporary Well: (YES)	Depth to Static Water Level: 929.63
Total Depth of Well: 10.5 FEET	Depth to Bedrock: NA	Top of Casing: 936.98
Drilling Company: AQUADRILL, INC.		Top of Screen: 930.0
Company Address CORALVILLE IOWA		City, State, Zip:
Certified Driller's Signature:		Logged by: CHEM-ECO (rtk)
Driller's Registration Number:		Date Logged:9-1-99

Depth (feet)	Well Construction Sketch	Sample No.	***Type	PID / FID Reading	Rock Formations, Soil, Color and Classifications, Observations (moisture, odor, etc.) First column for USCS
0.0'-0.6'	CASING: 1.98 FT 0 TO 5 FEET HOLE PLUG: 0 TO 3 FEET SAND PACK: 3 TO 10 FEET SCREEN: 5 TO 10 FEET	7-1	CC	NA	BLACK SILT
0.6'-1.8'		7-2	CC	NA	BLACK FILL MIXED w/ FOUNDRY SAND
1.8'-4.0'		7-3	CC	NA	BROWN CLAYEY SAND
4.0'-10.5'		7-4	CC	NA	BROWN SAND



Examples of Observations (right column):

cement; rock; crushed gravel/fill material; black silt, loose, moist; sands, moist, brown, firm; sand, dark gray, moist, petroleum odor; clay, sandy, brown, dry; gravely sand, dry; silty sands, moist

* Example: MW-1 or SB-1

** Example: 15 feet X 7 inches

*** Hollow Stem Auger (HS), Split Spoon (SS), Continuous Core (CC)

SOIL BORING LOG AND MONITORING WELL CONSTRUCTION DIAGRAM

*Boring/Well Identification: S-8	UST Registration No.:	LUST No.:
**Boring Depth (ft) X Diameter (in): 3.0 x 4.5		Well Owner's Name: Hawkeye Casting
Start Date: 9-1-99	Finish Date: 9-1-99	Drilling Method: CC
Permanent Well: (N)	Temporary Well: (N)	Depth to Static Water Level: NA
Total Depth of Well: NA	Depth to Bedrock: NA	Top of Casing: NA
Drilling Company: AQUADRILL, INC.		Top of Screen: NA
Company Address CORALVILLE IOWA		City, State, Zip:
Certified Driller's Signature:		Logged by: CHEM-ECO (rtk)
Driller's Registration Number:		Date Logged:9-1-99

Depth (feet)	Well Construction Sketch	Sample No.	***Type	PID / FID Reading	Rock Formations, Soil, Color and Classifications, Observations (moisture, odor, etc.) First column for USCS
0.0'-0.2'	NA	8-1	CC	NA	BROWN CLAYEY SILT w/ ORGANICS
0.2'-1.2'	NA	8-2	CC	NA	BLACK FILL MIXED w/ FOUDARY SAND
1.2'-3.0'	NA	8-3	CC	NA	BROWN CLAYEY SAND

Examples of Observations (right column):

cement; rock; crushed gravel/fill material; black silt, loose, moist; sands, moist, brown, firm; sand, dark gray, moist, petroleum odor; clay, sandy, brown, dry; gravely sand, dry; silty sands, moist

* Example: MW-1 or SB-1

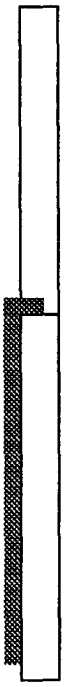
** Example: 15 feet X 7 inches

*** Hollow Stem Auger (HS), Split Spoon (SS), Continuous Core (CC)

SOIL BORING LOG AND MONITORING WELL CONSTRUCTION DIAGRAM

*Boring/Well Identification: S-9/TMW-2	UST Registration No.:	LUST No.:
**Boring Depth (ft) X Diameter (in): 10.5 x 6.25		Well Owner's Name: Hawkeye Casting
Start Date: 9-1-99	Finish Date: 9-1-99	Drilling Method: HS & CC
Permanent Well: (N)	Temporary Well: (YES)	Depth to Static Water Level: 930.18
Total Depth of Well: 10.5 FEET	Depth to Bedrock: NA	Top of Casing: 937.00
Drilling Company: AQUADRILL, INC.		Top of Screen: 930.0
Company Address CORALVILLE IOWA		City, State, Zip:
Certified Driller's Signature:		Logged by: CHEM-ECO (rtk)
Driller's Registration Number:		Date Logged:9-1-99

Depth (feet)	Well Construction Sketch	Sample No.	***Type	PID / FID Reading	Rock Formations, Soil, Color and Classifications, Observations (moisture, odor, etc.) First column for USCS
0.0'-0.4'	CASING: 1.93 FT	9-1	CC	NA	BROWN CLAYEY SILT
0.4'-1.1'	0 TO 5 FEET	9-2	CC	NA	BLACK FILL MIXED w/ FOUNDRY SAND
1.1'-2.8'	HOLE PLUG: 0 TO 3 FEET	9-3	CC	NA	BROWN CLAYEY SAND
2.8'-9.5'	SAND PACK: 3 TO 10 FEET	9-4	CC	NA	LIGHT BROWN CLAYEY SAND w/ GRAVEL (ALUVIUM)
	SCREEN: 5 TO 10 FEET				
9.5'-10.5'		9-5	CC	NA	FINE BROWN CLAYEY SAND



Examples of Observations (right column):

cement; rock; crushed gravel/fill material; black silt, loose, moist; sands, moist, brown, firm; sand, dark gray, moist, petroleum odor; clay, sandy, brown, dry; gravely sand, dry; silty sands, moist

* Example: MW-1 or SB-1

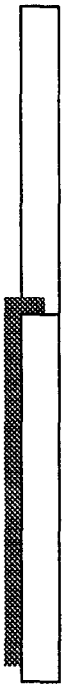
** Example: 15 feet X 7 inches

*** Hollow Stem Auger (HS), Split Spoon (SS), Continuous Core (CC)

SOIL BORING LOG AND MONITORING WELL CONSTRUCTION DIAGRAM

*Boring/Well Identification: S-10/TMW-3	UST Registration No.:	LUST No.:
**Boring Depth (ft) X Diameter (in): 15.0 x 6.25		Well Owner's Name: Hawkeye Casting
Start Date: 9-1-99	Finish Date: 9-1-99	Drilling Method: HS & CC
Permanent Well: (N)	Temporary Well: (YES)	Depth to Static Water Level: 928.86
Total Depth of Well: 12.5 FEET	Depth to Bedrock: NA	Top of Casing: 936.34
Drilling Company: AQUADRILL, INC.		Top of Screen: 927.43
Company Address CORALVILLE IOWA		City, State, Zip:
Certified Driller's Signature:		Logged by: CHEM-ECO (rtk)
Driller's Registration Number:		Date Logged:9-1-99

Depth (feet)	Well Construction Sketch	Sample No.	***Type	PID / FID Reading	Rock Formations, Soil, Color and Classifications, Observations (moisture, odor, etc.) First column for USCS
0.0'-0.4'	CASING: 1.91 FT	10-1	CC	NA	BROWN SANDY SILT
0.4'-5.3'	0 TO 7 FEET HOLE PLUG: 0 TO 5 FEET SAND PACK:	10-2	CC	NA	BLACK FILL MIXED w/ FOUNDRY SAND
5.3'-9.0'	3 TO 12 FEET SCREEN: 5 TO 12 FEET	10-3	CC	NA	BLACK SAND (ALUVIUM)
9.0'-15.0'		10-4	CC	NA	BROWN SAND



Examples of Observations (right column):

cement; rock; crushed gravel/fill material; black silt, loose, moist; sands, moist, brown, firm; sand, dark gray, moist, petroleum odor; clay, sandy, brown, dry; gravely sand, dry; silty sands, moist

* Example: MW-1 or SB-1

** Example: 15 feet X 7 inches

*** Hollow Stem Auger (HS), Split Spoon (SS), Continuous Core (CC)

SOIL BORING LOG AND MONITORING WELL CONSTRUCTION DIAGRAM

*Boring/Well Identification: S-11	UST Registration No.:	LUST No.:
**Boring Depth (ft) X Diameter (in): 4.2 x 4.5		Well Owner's Name: Hawkeye Casting
Start Date: 9-1-99	Finish Date: 9-1-99	Drilling Method: CC
Permanent Well: (N)	Temporary Well: (N)	Depth to Static Water Level: NA
Total Depth of Well: NA	Depth to Bedrock: NA	Top of Casing: NA
Drilling Company: AQUADRILL, INC.		Top of Screen: NA
Company Address CORALVILLE IOWA		City, State, Zip:
Certified Driller's Signature:		Logged by: CHEM-ECO (rtk)
Driller's Registration Number:		Date Logged:9-1-99

Depth (feet)	Well Construction Sketch	Sample No.	***Type	PID / FID Reading	Rock Formations, Soil, Color and Classifications, Observations (moisture, odor, etc.) First column for USCS
0.0'-1.5'	NA	11-1	CC	NA	BLACK FILL MIXED w/ FOUDARY SAND
1.5'-2.4'	NA	11-2	CC	NA	BLACK SANDY CLAY
2.4'-3.3'	NA	11-3	CC	NA	BROWN SANDY CLAY
3.3'-4.2'	NA	11-4	CC	NA	BROWN & GRAY CLAYEY SAND w/ SOME GRAVEL (MOISTURE/OXIDATION)

Examples of Observations (right column):

cement; rock; crushed gravel/fill material; black silt, loose, moist; sands, moist, brown, firm; sand, dark gray, moist, petroleum odor; clay, sandy, brown, dry; gravely sand, dry; silty sands, moist

* Example: MW-1 or SB-1

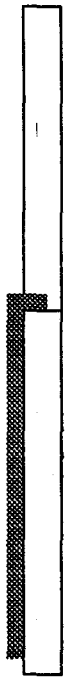
** Example: 15 feet X 7 inches

*** Hollow Stem Auger (HS), Split Spoon (SS), Continuous Core (CC)

SOIL BORING LOG AND MONITORING WELL CONSTRUCTION DIAGRAM

*Boring/Well Identification: S-12/TMW-4	UST Registration No.:	LUST No.:
**Boring Depth (ft) X Diameter (in): 10.5 x 6.25		Well Owner's Name: Hawkeye Casting
Start Date: 9-1-99	Finish Date: 9-1-99	Drilling Method: HS & CC
Permanent Well: (N)	Temporary Well: (YES)	Depth to Static Water Level: 929.69
Total Depth of Well: 10.5 FEET	Depth to Bedrock: NA	Top of Casing: 936.84
Drilling Company: AQUADRILL, INC.		Top of Screen: 929.94
Company Address CORALVILLE IOWA		City, State, Zip:
Certified Driller's Signature:		Logged by: CHEM-ECO (rtk)
Driller's Registration Number:		Date Logged:9-1-99

Depth (feet)	Well Construction Sketch	Sample No.	***Type	PID / FID Reading	Rock Formations, Soil, Color and Classifications, Observations (moisture, odor, etc.) First column for USCS
0.0'-1.4'	CASING: 1.90 FT	12-1	CC	NA	DARK BROWN SILT
1.4'-2.0'	0 TO 5 FEET	12-2	CC	NA	BROWN SILTY SAND
	HOLE PLUG:				
2.0'-2.4'	0 TO 3 FEET	12-3	CC	NA	BROWN /GRAY SANDY CLAY
	SAND PACK:				
2.4'-10.5'	3 TO 10 FEET	12-3	CC	NA	BROWN SAND COARSER w/ DEPTH (ALUVIUM)
	SCREEN: 5 TO 10 FEET				BROWN SAND



Examples of Observations (right column):

cement; rock; crushed gravel/fill material; black silt, loose, moist; sands, moist, brown, firm; sand, dark gray, moist, petroleum odor; clay, sandy, brown, dry; gravely sand, dry; silty sands, moist

* Example: MW-1 or SB-1

** Example: 15 feet X 7 inches

*** Hollow Stem Auger (HS), Split Spoon (SS), Continuous Core (CC)

SOIL BORING LOG AND MONITORING WELL CONSTRUCTION DIAGRAM

*Boring/Well Identification: S-13	UST Registration No.:	LUST No.:
**Boring Depth (ft) X Diameter (in): 4.3 x 4.5		Well Owner's Name: Hawkeye Casting
Start Date: 9-1-99	Finish Date: 9-1-99	Drilling Method: CC
Permanent Well: (N)	Temporary Well: (N)	Depth to Static Water Level: NA
Total Depth of Well: NA	Depth to Bedrock: NA	Top of Casing: NA
Drilling Company: AQUADRILL, INC.		Top of Screen: NA
Company Address CORALVILLE IOWA		City, State, Zip:
Certified Driller's Signature:		Logged by: CHEM-ECO (rtk)
Driller's Registration Number:		Date Logged:9-1-99

Depth (feet)	Well Construction Sketch	Sample No.	***Type	PID / FID Reading	Rock Formations, Soil, Color and Classifications, Observations (moisture, odor, etc.) First column for USCS
0.0'-0.7'	NA	13-1	CC	NA.	BROWN CLAY SILT
0.7'-1.3'	NA	13-2	CC	NA	BLACK FILL MIXED w/ FOUDARY SAND
1.3'-2.0'	NA	13-3	CC	NA	DARK BROWN SANDY CLAY
2.0'-3.7'	NA	13-4	CC	NA	BLACK SANDY CLAY
3.7'-3.9'	NA	13-5	CC	NA	BLACK SAND (ALUVIUM)
3.9'-4.3'	NA	13-6	CC	NA	GRAY SANDY CLAY

Examples of Observations (right column):

cement; rock; crushed gravel/fill material; black silt, loose, moist; sands, moist, brown, firm; sand, dark gray, moist, petroleum odor; clay, sandy, brown, dry; gravely sand, dry; silty sands, moist

* Example: MW-1 or SB-1

** Example: 15 feet X 7 inches

*** Hollow Stem Auger (HS), Split Spoon (SS), Continuous Core (CC)

SOIL BORING LOG AND MONITORING WELL CONSTRUCTION DIAGRAM

*Boring/Well Identification: S-14	UST Registration No.:	LUST No.:
**Boring Depth (ft) X Diameter (in): 4.4 x 4.5		Well Owner's Name: Hawkeye Casting
Start Date: 9-1-99	Finish Date: 9-1-99	Drilling Method: CC
Permanent Well: (N)	Temporary Well: (N)	Depth to Static Water Level: NA
Total Depth of Well: NA	Depth to Bedrock: NA	Top of Casing: NA
Drilling Company: AQUADRILL, INC.		Top of Screen: NA
Company Address CORALVILLE IOWA		City, State, Zip:
Certified Driller's Signature:		Logged by: CHEM-ECO (cew)
Driller's Registration Number:		Date Logged:9-1-99

Depth (feet)	Well Construction Sketch	Sample No.	***Type	PID / FID Reading	Rock Formations, Soil, Color and Classifications, Observations (moisture, odor, etc.) First column for USCS
0.0'-0.5'	NA	14-1	CC	NA	BROWN CLAYEY SILT w/ ORGANICS
0.5'-1.3'	NA	14-2	CC	NA	DARK BROWN SANDY SILT w/ TRACE FOUNDRY SAND
1.3'-3.3'	NA	14-3	CC	NA	BLACK SANDY CLAY w/ GRAVEL
3.3'-4.4'	NA	14-4	CC	NA	GRAY SAND (ALUVIUM) w/ GRAVEL

Examples of Observations (right column):

cement; rock; crushed gravel/fill material; black silt, loose, moist; sands, moist, brown, firm; sand, dark gray, moist, petroleum odor; clay, sandy, brown, dry; gravely sand, dry; silty sands, moist

* Example: MW-1 or SB-1

** Example: 15 feet X 7 inches

*** Hollow Stem Auger (HS), Split Spoon (SS), Continuous Core (CC)

SOIL BORING LOG AND MONITORING WELL CONSTRUCTION DIAGRAM

*Boring/Well Identification: S-15	UST Registration No.:	LUST No.:
**Boring Depth (ft) X Diameter (in): 4.3 x 4.5		Well Owner's Name: Hawkeye Casting
Start Date: 9-1-99	Finish Date: 9-1-99	Drilling Method: CC
Permanent Well: (N)	Temporary Well: (N)	Depth to Static Water Level: NA
Total Depth of Well: NA	Depth to Bedrock: NA	Top of Casing: NA
Drilling Company: AQUADRILL, INC.		Top of Screen: NA
Company Address CORALVILLE IOWA		City, State, Zip:
Certified Driller's Signature:		Logged by: CHEM-ECO (cew)
Driller's Registration Number:		Date Logged:9-1-99

Depth (feet)	Well Construction Sketch	Sample No.	***Type	PID / FID Reading	Rock Formations, Soil, Color and Classifications, Observations (moisture, odor, etc.) First column for USCS
0.0'-0.6'	NA	15-1	CC	NA	BROWN SILT w/ ORGANICS
0.6'-1.4'	NA	15-2	CC	NA	DARK BROWN SILTY CLAY
1.4'-3.3'	NA	15-3	CC	NA	BROWN/GRAY CLAYEY SAND [2.6'-2.9' FINE SAND LENS]
3.3'-4.3'	NA	15-4	CC	NA	BROWN SAND (ALUVIUM) w/ GRAVEL

Examples of Observations (right column):

cement; rock; crushed gravel/fill material; black silt, loose, moist; sands, moist, brown, firm; sand, dark gray, moist, petroleum odor; clay, sandy, brown, dry; gravely sand, dry; silty sands, moist

* Example: MW-1 or SB-1

** Example: 15 feet X 7 inches

*** Hollow Stem Auger (HS), Split Spoon (SS), Continuous Core (CC)

Iowa Department of Natural Resources

Abandoned Water Well
Plugging Record

1. **Owner:**

Name: Hawkeye Castings City: Manchester State: IA
Address: 1077 So. 3rd Street Zip: 52057 Phone: (563) 927-2950

2. **Well (Cistern) Location:**

SE 1/4 of, SW 1/4 of, ____ 1/4 of, Section 32, Twp. 88 N, Range 5 (West) East (circle one)
Delaware County, Describe well location on property: Midpoint (6,2)
50 ft west and 25 ft south of midpoint of building west wall

3. **Description:**

Well depth:	12 ft.	Casing material: steel, (plastic), concrete, clay, brick, stone	
Depth to water:	7 ft.	(circle one)	
Casing diameter:	2 in.	Type of construction: drilled, driven, bored, dug, (augered)	
Yr. or decade constrd.:	1999	(circle one)	
Depth of casing:	ft.	Check ☑ if this is a Monitoring Well	Well I D.: TMW-3

Check ☐ if Cistern depth: _____ ft. diameter: _____ ft.

I certify this well has been plugged as required by rule 567-39.8 of the Iowa Administrative Code (IAC). I agree to provide any additional information the county or department may need concerning this well.
Signature of Owner: John S. Tyree Date Plugged: 11-21-01

If plugged by certified well contractor, complete this box:

I have plugged this well as required by rule 567-39.8 of the Iowa Administrative Code (IAC).
Signature of Contractor: Justin Reverts Cert. No. 4028!

OR, If plugged by well owner, complete this box:

The property owner has plugged this well following requirements in rule 567-39.8 of the Iowa Administrative Code with the oversight and assistance of the designated county agent.
Signature of County Agent: _____ Date Approved: _____

Eligible for Grants-to-Counties cost share: ☐ YES ☐ NO (Determined by County Agent)

Complete one form for each well plugged and submit within 30 days to the local county agent:

or, only if no county agent is available, to:

Water Supply Section
Department of Natural Resources
900 East Grand Avenue
Des Moines, IA 50319-0034

Iowa Department of Natural Resources

Abandoned Water Well
Plugging Record

1. **Owner**:

Name:	Hawkeye Castings	City:	Manchester	State:	IA
Address:	1077 So. 3rd Street	Zip:	52057	Phone:	(563) 927-2950

2. **Well (Cistern) Location**:

SE 1/4 of, SW 1/4 of, ____ 1/4 of, Section 32, Twp. 88 N, Range 5 (West)/East (circle one)

Delaware County, Describe well location on property: Gridpoint (4,0) 200 ft west and 75 ft south of southwest corner of the building

3. **Description:**

Well depth:	12 ft.	Casing material:	steel, (plastic), concrete, clay, brick, stone (circle one)
Depth to water:	7 ft.		
Casing diameter:	2 in.	Type of construction:	drilled, driven, bored, dug, (augered) (circle one)
Yr. or decade constrd.:	1999		
Depth of casing:	ft.	Check ☑ if this is a Monitoring Well	Well I D.: TMW-4

Check ☐ if Cistern depth: ________ ft. diameter: ________ ft.

I certify this well has been plugged as required by rule 567-39.8 of the Iowa Administrative Code (IAC). I agree to provide any additional information the county or department may need concerning this well.

Signature of Owner: John S. Tyrrea Date Plugged: 11-21-01

If plugged by certified well contractor, complete this box:

I have plugged this well as required by rule 567-39.8 of the Iowa Administrative Code (IAC).

Signature of Contractor: Justin Kewt Cert. No. 40281

OR, If plugged by well owner, complete this box:

The property owner has plugged this well following requirements in rule 567-39.8 of the Iowa Administrative Code with the oversight and assistance of the designated county agent.

Signature of County Agent: ________ Date Approved: ________

Eligible for Grants-to-Counties cost share: ☐ YES ☐ NO (Determined by County Agent)

Complete one form for each well plugged and submit within 30 days to the local county agent:	or, only if no county agent is available, to:
	Water Supply Section **Department of Natural Resources** **900 East Grand Avenue** **Des Moines, IA 50319-0034**

Iowa Department of Natural Resources

Abandoned Water Well
Plugging Record

1. Owner:

Name: Hawkeye Castings City: Manchester State: IA
Address: 1077 So. 3rd Street Zip: 52057 Phone: (563) 927-2950

2. Well (Cistern) Location:

SE 1/4 of, SW 1/4 of, ____ 1/4 of, Section 32, Twp. 88 N, Range 5 (West) East (circle one)
Delaware County, Describe well location on property: Sandpoint (5,4)
100 ft west of northwest corner of the building

3. Description:

Well depth:	12 ft.	Casing material: steel, (plastic) concrete, clay, brick, stone (circle one)	
Depth to water:	7 ft.		
Casing diameter:	2 in.	Type of construction: drilled, driven, bored, dug, (augered) (circle one)	
Yr. or decade constrd.:	1999		
Depth of casing:	ft.	Check ☑ if this is a Monitoring Well	Well I D.: TMW-1

Check ☐ if Cistern depth: _____ ft. diameter: _____ ft.

I certify this well has been plugged as required by rule 567-39.8 of the Iowa Administrative Code (IAC). I agree to provide any additional information the county or department may need concerning this well.
Signature of Owner: John S. Tyrrell Date Plugged: 11-21-02

If plugged by certified well contractor, complete this box:

I have plugged this well as required by rule 567-39.8 of the Iowa Administrative Code (IAC).
Signature of Contractor: Justin Kewley Cert. No. 40281

OR, If plugged by well owner, complete this box:

The property owner has plugged this well following requirements in rule 567-39.8 of the Iowa Administrative Code with the oversight and assistance of the designated county agent.

Signature of County Agent: _____ Date Approved: _____

Eligible for Grants-to-Counties cost share: ☐ YES ☐ NO (Determined by County Agent)

Complete one form for each well plugged and submit within 30 days to the local county agent:	or, only if no county agent is available, to:
	Water Supply Section **Department of Natural Resources** **900 East Grand Avenue** **Des Moines, IA 50319-0034**

Iowa Department of Natural Resources

Abandoned Water Well
Plugging Record

1. Owner:

Name: Hawkeye Castings City: Manchester State: IA
Address: 1077 So. 3rd Street Zip: 52057 Phone: (563) 927-2950

2. Well (Cistern) Location:

SE 1/4 of, SW 1/4 of, ____ 1/4 of, Section 32, Twp. 88 N, Range 5 (West) East (circle one)
Delaware County, Describe well location on property: Gridpoint (4,2)
150 ft west and 25 ft south of midpoint of west wall of the building

3. Description:

Well depth:	12 ft.	Casing material: steel, (plastic), concrete, clay, brick, stone	
Depth to water:	7 ft.	(circle one)	
Casing diameter:	2 in.	Type of construction: drilled, driven, bored, dug, (augered)	
Yr. or decade constrd.:	1999	(circle one)	
Depth of casing:	____ ft.	Check ☑ if this is a Monitoring Well	Well I D.: TMW-2

Check ☐ if Cistern depth: ____ ft. diameter: ____ ft.

I certify this well has been plugged as required by rule 567-39.8 of the Iowa Administrative Code (IAC). I agree to provide any additional information the county or department may need concerning this well.
Signature of Owner: John S Tuscano Date Plugged: 11-21-03

If plugged by certified well contractor, complete this box:

I have plugged this well as required by rule 567-39.8 of the Iowa Administrative Code (IAC).
Signature of Contractor: Justin Rewerts Cert. No. 40281

OR, If plugged by well owner, complete this box:

The property owner has plugged this well following requirements in rule 567-39.8 of the Iowa Administrative Code with the oversight and assistance of the designated county agent.
Signature of County Agent: ____ Date Approved: ____

Eligible for Grants-to-Counties cost share: ☐ YES ☐ NO (Determined by County Agent)

Complete one form for each well plugged and submit within 30 days to the local county agent:

or, only if no county agent is available, to:

Water Supply Section
Department of Natural Resources
900 East Grand Avenue
Des Moines, IA 50319-0034

DNR FORM (REV 12/95) **542-1226**

Appendix D

Soil Disposal Documents

Joel

STATEMENT OF ACCOUNT WITH

DELAWARE COUNTY LANDFILL

P.O. Box 211 Phone 319-922-2520 Delhi, Iowa 52223

Denver Construction Co.
Box 257 - 241 South State St
Nov. Account Denver Iowa 50622
ATTN: Joel Wickner

This account in subject to a FINANCE CHARGE OF 11/2% per cent (18 PER CENT ANNUAL PERCENTAGE RATE) if not paid by the 10th of the month following purchase.

DATE	REFERENCE	CHARGES	CREDITS	BALANCE
BALANCE FORWARDED				
From	Hawkeye Castings	- @ Manchester		
11-29-00	16785	472 80		472 80
11-29-00	16786	246 90		719 70
11-29-00	16787	692 40		1,412 10
				1,412 10

16785

DATE

CUSTOMER ☐ Denver Construction

ADDRESS

CITY STATE ZIP

Cash ☐

Charge ☑

On Acct. ☐

Amt. Due 472.80

10:07 11/29/00
35360 LB G GROSS

10:07 11/29/00 TARE
25600 LB G

10:20 11/29/00 NET
21720 LB G 15.7

10:21 11/29/00
7720 LB G

DRIVER ON ☐ OFF ☑ Rec'd

DELAWARE COUNTY LANDFILL
P.O. Box 211
DELHI, IOWA 52223
Phone (319) 922-2520

16786

DATE

CUSTOMER ☐ Denver Construction

ADDRESS

CITY STATE ZIP

Cash ☐

Charge ☑

On Acct. ☐

Amt. Due 246.90

10:08 11/29/00
40220 LB G GROSS

10:22 11/29/00 TARE
23760 LB G

8.23 NET

DRIVER ON ☐ OFF ☑ Rec'd

DELAWARE COUNTY LANDFILL
P.O. Box 211
DELHI, IOWA 52223
Phone (319) 922-2520

16787

DATE _____

CUSTOMER ☐ Denver Construction

ADDRESS _____

CITY _____ STATE _____ ZIP _____

Cash ☐

Charge ☑

On Acct. ☐

Amt. Due 692.40

11:53 11/29/00
44180 LB G GROSS

11:54 11/29/00 TARE
31460 LB G

12:11 11/29/00 NET
21740 LB G 23.08

12:11 11/29/00
7740 LB G

DRIVER ON ☐ OFF ☑ Rec'd _____

DELAWARE COUNTY LANDFILL

P.O. Box 211
DELHI, IOWA 52223
Phone (319) 922-2520

Appendix E

Soil Sample Analytical Reports
Closure Activities 31 August 1999 - 01 September 1999

TestAmerica
INCORPORATED

ANALYTICAL REPORT

Carol Wilson
CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

09/13/1999

Date Received: 09/03/1999
Job Number: 99.11324

	Flag	Result	Units	Date Taken	Date Analyzed	Analyst	Analysis Method
526215 S-1 Proj. #98-022							
Lead	MSO	180	mg/kg	08/31/1999	09/10/1999	llw	SW 7420
ICP Metals Prep (Solid)		1.011	g	08/31/1999	09/08/1999	mpc	
526216 S-1D Proj. #98-022							
Lead		110	mg/kg	08/31/1999	09/10/1999	llw	SW 7420
ICP Metals Prep (Solid)		1.007	g	08/31/1999	09/08/1999	mpc	
526217 S-2 Proj. #98-022							
Lead		110	mg/kg	08/31/1999	09/10/1999	llw	SW 7420
ICP Metals Prep (Solid)		1.001	g	08/31/1999	09/08/1999	mpc	
526218 S-3 Proj. #98-022							
Lead		21	mg/kg	08/31/1999	09/10/1999	llw	SW 7420
ICP Metals Prep (Solid)		1.013	g	08/31/1999	09/08/1999	mpc	
526219 S-4 Proj. #98-022							
Lead		34	mg/kg	08/31/1999	09/10/1999	llw	SW 7420
ICP Metals Prep (Solid)		1.070	g	08/31/1999	09/08/1999	mpc	
526220 S-5 Proj. #98-022							
Lead		51	mg/kg	08/31/1999	09/10/1999	llw	SW 7420
ICP Metals Prep (Solid)		1.039	g	08/31/1999	09/08/1999	mpc	

Key to flags:
MSO - MS and/or MSD are out of control for this analyte

Kristin Voigts

Kristin M. Voigts
Operations Manager
Iowa Lab Certification - 7

TestAmerica
INCORPORATED

ANALYTICAL REPORT

Carol Wilson
CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

09/13/1999

Date Received: 09/03/1999
Job Number: 99.11324

	Flag	Result	Units	Date Taken	Date Analyzed	Analyst	Analysis Method
526221 S-6-1 Proj. #98-022							
Lead		330	mg/kg	08/31/1999	09/10/1999	llw	SW 7420
ICP Metals Prep (Solid)		1.020	g	08/31/1999	09/08/1999	mpc	
526222 S-6-2 Proj. #98-022							
Lead		12	mg/kg	08/31/1999	09/10/1999	llw	SW 7420
ICP Metals Prep (Solid)		1.012	g	08/31/1999	09/08/1999	mpc	
526223 S-7-1 Proj. #98-022							
Lead		720	mg/kg	08/31/1999	09/10/1999	llw	SW 7420
ICP Metals Prep (Solid)		1.029	g	08/31/1999	09/08/1999	mpc	
526224 S-7-2 Proj. #98-022							
Lead		<5.0	mg/kg	08/31/1999	09/10/1999	llw	SW 7420
ICP Metals Prep (Solid)		1.063	g	08/31/1999	09/08/1999	mpc	
526225 S-8-1 Proj. #98-022							
Lead		260	mg/kg	08/31/1999	09/10/1999	llw	SW 7420
ICP Metals Prep (Solid)		1.029	g	08/31/1999	09/08/1999	mpc	
526226 S-8-2 Proj. #98-022							
Lead		<5.0	mg/kg	08/31/1999	09/10/1999	llw	SW 7420
ICP Metals Prep (Solid)		1.032	g	08/31/1999	09/08/1999	mpc	

Key to flags:

Kristin Voigts

Kristin M. Voigts
Operations Manager
Iowa Lab Certification - 7

TestAmerica
INCORPORATED

ANALYTICAL REPORT

Carol Wilson
CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

09/13/1999

Date Received: 09/03/1999
Job Number: 99.11324

	Flag	Result	Units	Date Taken	Date Analyzed	Analyst	Analysis Method
526227 S-8-2D Proj. #98-022							
Lead		<5.0	mg/kg	08/31/1999	09/10/1999	llw	SW 7420
ICP Metals Prep (Solid)		1.012	g	08/31/1999	09/08/1999	mpc	
526228 S-9-1 Proj. #98-022							
Lead		240	mg/kg	08/31/1999	09/10/1999	llw	SW 7420
ICP Metals Prep (Solid)		1.027	g	08/31/1999	09/08/1999	mpc	
526229 S-9-2 Proj. #98-022							
Lead		5.6	mg/kg	08/31/1999	09/10/1999	llw	SW 7420
ICP Metals Prep (Solid)		1.012	g	08/31/1999	09/08/1999	mpc	
526230 S-11-1 Proj. #98-022							
Lead		900	mg/kg	08/31/1999	09/10/1999	llw	SW 7420
ICP Metals Prep (Solid)		1.069	g	08/31/1999	09/08/1999	mpc	
526231 S-11-2 Proj. #98-022							
Lead		6.8	mg/kg	08/31/1999	09/10/1999	llw	SW 7420
ICP Metals Prep (Solid)		1.047	g	08/31/1999	09/08/1999	mpc	
526232 S-12-1 Proj. #98-022							
Lead		5.9	mg/kg	08/31/1999	09/10/1999	llw	SW 7420
ICP Metals Prep (Solid)		1.059	g	08/31/1999	09/08/1999	mpc	

Key to flags:

Kristin Voigts

Kristin M. Voigts
Operations Manager
Iowa Lab Certification - 7

TestAmerica
INCORPORATED

ANALYTICAL REPORT

Carol Wilson
CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

09/13/1999

Date Received: 09/03/1999
Job Number: 99.11324

	Flag	Result	Units	Date Taken	Date Analyzed	Analyst	Analysis Method
526233 S-12-2 Proj. #98-022							
Lead		<5.0	mg/kg	08/31/1999	09/10/1999	llw	SW 7420
ICP Metals Prep (Solid)		1.038	g	08/31/1999	09/08/1999	mpc	
526234 S-14-1 Proj. #98-022							
Lead		7.5	mg/kg	09/01/1999	09/10/1999	llw	SW 7420
ICP Metals Prep (Solid)		1.079	g	09/01/1999	09/08/1999	mpc	
526235 S-14-2 Proj. #98-022							
Lead		<5.0	mg/kg	09/01/1999	09/10/1999	llw	SW 7420
ICP Metals Prep (Solid)		1.023	g	09/01/1999	09/08/1999	mpc	
526236 S-10-1 Proj. #98-022							
Solid pH Measured in Water		7.9	units	09/01/1999	09/08/1999	sas	SW 9045
Solids, Total		93.36	%	09/01/1999	09/07/1999	sas	SM 2540 G
ICP TCLP METALS				09/01/1999			
TCLP Lead (ICP)		18	mg/L	09/01/1999	09/08/1999	llw	SW 6010B

Key to flags:

Kristin Voigts

Kristin M. Voigts
Operations Manager
Iowa Lab Certification - 7

TestAmerica INCORPORATED

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613

Phone: 319 - 277 - 2401 or 1 - 800 - 750 - 2401
Fax: 319 - 277 - 2425

Company: CHEM-ECO Environmental inc
Send Report To: Carol Wilson
Address: P.O. Box 367
City/State/Zip Code: Anamosa IA 52205
Telephone Number: 319 484 2618 Fax: 319 484 2618
Sampled by: (Print Name) Carol Wilson
(Signature) Carol E Wilson

Your PO #:
Invoice To: CHEM-ECO
TA Quote #:
Project Name:
Project Number: 98-022
Project Manager: Carol Wilson
Proj. Mgr. Telephone:

Sample ID	Date Sampled	Time Sampled	# of containers shipped	Grab	Composite	Field Filtered	Preservative: Ice	HNO_3 (Red & White Label)	HCl (Blue & White Label)	NaOH (Orange & White Label)	H_2SO_4 Plastic (Yellow & White Label)	H_2SO_4 Glass(Yellow & White Label)	None (Black & White Label)	Other (Specify)	Matrix: Groundwater	Wastewater	Drinking Water	Sludge	Soil	Other Specify:	Analyze For: Total Lead	RUSH TAT (Must call ahead!)	Standard TAT	Fax Results	Send QC with report
S-1	8.31.99	2m	1	✓			✓						✓						✓		✓				
S-1D	8.31.99		1	✓			✓						✓						✓		✓				
S-2	8.31.99		1	✓			✓						✓						✓		✓				
S-3	8.31.99		1	✓			✓						✓						✓		✓				
S-4	8.31.99		1	✓			✓						✓						✓		✓				
S-5	8.31.99		1	✓			✓						✓						✓		✓				
S-6-1	8.31.99		1	✓			✓						✓						✓		✓				
S-6-2	8.31.99		1	✓			✓						✓						✓		✓				
S-7-1	8.31.99		1	✓			✓						✓						✓		✓				
S-7-2	8.31.99	↓	1	✓			✓						✓						✓		✓				

NOTE: All turn around times are calculated from the time of receipt at TestAmerica.
***NOTICE:* Pre-Arrangements must be made *AT LEAST 48 Hours in ADVANCE* to receive results with RUSH turn around time commitments; *additional charges* may be assessed.**
NOTE: There may be a charge assessed for TestAmerica disposing of sample remainders.

NOTES:

Relinquished by:	Date	Time	Received by:	Date	Time	Relinquished by:	Date	Time
Carol E Wilson	9.2.99	1100am						
Shipped Via:			Comments:			Shipped Via:		
Received for TestAmerica by:	Date	Time	Temperature Upon Receipt:			Laboratory Comments:		
Donna Johnson	9/3/99	8:00						

TestAmerica INCORPORATED

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613

Phone: 319 - 277 - 2401 or 1 - 800 - 750 - 2401
Fax: 319 - 277 - 2425

Company: CHEM-ECO Environmental
Send Report To: Carol Wilson
Address: P.O. Box 367
City/State/Zip Code: Anamosa IA 52205
Telephone Number: 319 484 2618 Fax: 319 484 2618
Sampled by: (Print Name) Carol Wilson
(Signature) Carol E Wilson

Your PO #:
Invoice To: CHEM-ECO
TA Quote #:
Project Name:
Project Number: 98-022
Project Manager: Carol Wilson
Proj. Mgr. Telephone: 319 484 2618

Sample ID	Date Sampled	Time Sampled	# of containers shipped	Grab	Composite	Field Filtered	Preservative: Ice	HNO_3 (Red & White Label)	HCl (Blue & White Label)	NaOH (Orange & White Label)	H_2SO_4 Plastic (Yellow & White Label)	H_2SO_4 Glass(Yellow & White Label)	None (Black & White Label)	Other (Specify)	Matrix: Groundwater	Wastewater	Drinking Water	Sludge	Soil	Other Specify: ~~Foundry sand~~	Analyze For: Total Lead	~~TCLP Arsenic~~	TCLP lead	RUSH TAT (Must call ahead!)	Standard TAT	Fax Results	Send QC with report
S-8-1	8.31.99	a.m	1	✓			✓						✓						✓		✓						
S-8-2	8.31.99		1	✓			✓						✓						✓		✓						
S-8-2D	8.31.99		1	✓			✓						✓						✓		✓						
S-9-1	8.31.99		1	✓			✓						✓						✓		✓						
S-9-2	8.31.99	↓	1	✓			✓						✓						✓		✓						
S-10-1	9.1.99	a.m.	1	✓			✓						✓						✓	✓		✓	✓				
S-11-1	8.31.99	p.m	1	✓			✓						✓						✓		✓						
S-11-2	8.31.99	p.m.	1	✓			✓						✓						✓		✓						
S-12-1	8.31.99	a.m	1	✓			✓						✓						✓		✓						
S-12-2	8.31.99	a.m.	1	✓			✓						✓						✓		✓						

NOTE: All turn around times are calculated from the time of receipt at TestAmerica.
NOTICE: **Pre-Arrangements must be made *AT LEAST 48 Hours in ADVANCE* to receive results with RUSH turn around time commitments; *additional charges* may be assessed.**
NOTE: There may be a charge assessed for TestAmerica disposing of sample remainders.

NOTES:
~~TCLP 48 hrs; eight RCRA metals~~
TCLP for lead only on foundry sand

Relinquished by:	Date	Time	Received by:	Date	Time	Relinquished by:	Date	Time
Carol E Wilson	9.2.99	1:00 p.m						
Shipped Via:			Comments:			Shipped Via:		
Received for TestAmerica by:	Date	Time	Temperature Upon Receipt:			Laboratory Comments:		
Donna Johnson	9/3/99	8:00						

TestAmerica INCORPORATED

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613

Phone: 319 - 277 - 2401 or 1 - 800 - 750 - 2401
Fax: 319 - 277 - 2425

Company: CHEM-ECO Environmental
Send Report To: Carol Wilson
Address: P.O. Box 367
City/State/Zip Code: Andrews IA 52205
Telephone Number: 319 484 2618 Fax: 319 484 2618
Sampled by: (Print Name) Carol Wilson
(Signature) Carol E Wilson

Your PO #:
Invoice To: CHEM-ECO
TA Quote #:
Project Name:
Project Number: 98-022
Project Manager:
Proj. Mgr. Telephone:

Sample ID	Date Sampled	Time Sampled	# of containers shipped	Grab	Composite	Field Filtered	Preservative: Ice	HNO_3 (Red & White Label)	HCl (Blue & White Label)	NaOH (Orange & White Label)	H_2SO_4 Plastic (Yellow & White Label)	H_2SO_4 Glass(Yellow & White Label)	None (Black & White Label)	Other (Specify)	Matrix: Groundwater	Wastewater	Drinking Water	Sludge	Soil	Other Specify:	Analyze For: Total Lead											RUSH TAT (Must call ahead!)	Standard TAT	Fax Results	Send QC with report
S-14-1	9.1.99	pm	1	1			✓						✓						✓		✓													
S-14-2	9.1.99	pm	1	1			✓						✓						✓		✓													

NOTE: All turn around times are calculated from the time of receipt at TestAmerica.
NOTICE: **Pre-Arrangements must be made *AT LEAST 48 Hours in ADVANCE* to receive results with RUSH turn around time commitments; *additional charges* may be assessed.**
NOTE: There may be a charge assessed for TestAmerica disposing of sample remainders.

NOTES:

Relinquished by:	Date	Time	Received by:	Date	Time	Relinquished by:	Date	Time
Carol E Wilson	9.2.99	11:00am						
Shipped Via:			Comments:			Shipped Via:		
Received for TestAmerica by:	Date	Time	Temperature Upon Receipt:			Laboratory Comments:		
Donna Johnson	9/3/99	8:10						

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VII
901 NORTH 5TH STREET
KANSAS CITY, KANSAS 66101

NOV - 9 1999

Dr. John Tyrrell
Hawkeye Castings, Inc/Tyrrell Investments, Inc.
410 North Franklin
Manchester, Iowa 52057

Dear Dr. Tyrrell:

RE: Transmittal of Analytical Results
Hawkeye Castings, Inc./ a/k/a Tyrrell Investments, Inc.
Manchester, Iowa
EPA RCRA ID No. IAD984599589
Docket No. VII-97-H-0008

The closure plan for the above mentioned facility was approved by the Environmental Protection Agency (EPA) on January 11, 1999. Partial closure activities were conducted on August 31, 1999, and September 1, 1999. The Environmental Protection Agency had a representative from the United States Geologic Survey (USGS) at the site during these closure activities to collect split samples.

Please find enclosed the analytical results from these split samples. If you have any questions on the information in this letter, please call me at (913) 551-7657.

Sincerely,

Mary Reilly Grisolano, P.E.
RCRA Corrective Action & Permits Branch
Air, RCRA, and Toxics Division

Enclosure

cc: Joseph Obr, Iowa Department of Natural Resources
Carol Wilson, Chemeco
Paul W. Johnson, Iowa Department of Natural Resources

United States Environmental Protection Agency

Region 7 Laboratory
25 Funston Road
Kansas City, KS 66115

Date: 11/2/1999

Subject: Transmittal of Sample Analysis Results for ASR #: 248
Activity Number: CAT02
Activity Description: Hawkeye Castings Inc.

From: Michael Thomas, Associate Laboratory Manager M. Thomas
Regional Laboratory, Environmental Services Division

To: Mary Grisolano
ARTD/RCAP

This is the sample analysis results transmittal for the above-referenced Analytical Services Request (ASR). The data contained in this transmittal have been approved by the Regional Laboratory. This transmittal contains all of the sample analysis results for this ASR. The Regional Laboratory should be notified within 14 days if any changes are needed to the contents of this report. If you have any questions, comments or data changes, please contact the Labortory Customer Service Department at 913-551-5295.

cc: Analytical Data File

ASR Number: 248

Summary of Activity Information
11/2/1999

Activity Leader: Grisolano, Mary **Org:** ARTD/RCAP **Phone:** (913) 551-7657
Activity Number: CAT02
Activity Desc: Hawkeye Castings Inc.
Location: Manchester **State:** Iowa **Type:** RCRA

Purpose: Compliance monitoring

Explanation of Codes, Units and Qualifiers used on this report.

Sample QC Codes: QC Codes identify the type of sample for quality control purposes.

__ = Field Sample

Units: Specific units in which results are reported.

%	= Percent
mg/kg	= Milligrams per Kilogram
mg/L	= Milligrams per Liter

Data Qualifiers: Specific codes used in conjunction with data values to provide additional information on the quality of reported results, or used to explain the absence of a specific value.

(Blank) = Values have been reviewed and found acceptable for use.

U = The material was analyzed for, but was not detected. The associated numerical value is the sample reporting limit.

Activity Number: CAT02 **ASR Number:** 248 **Sample Information Summary**

Activity Desc: Hawkeye Castings Inc. **11/2/1999**

Sample Number	QC Code	Matrix	Location	External Sample No.	Start Date	Start Time	End Date	End Time	Receipt Date
2-__		Soil	S-3 surface soil sample (0-6") NW corner of second. disposal area		08/31/1999	13:50			09/08/1999
3-__		Soil	S-10-2 subsurface soil		08/31/1999	13:05			09/08/1999
4-__		Soil	S-10-1 (foundry sand)		09/01/1999	11:15			09/08/1999

Analysis / Analyte	Units	2-__	3-__	4-__
Metals in Solids by ICP				
Lead	mg/kg	21.0	5.00 U	
Percent Solid				
Solids, percent	%	85.4	85.3	
TCLP Metals in Soil				
Lead	mg/L			14.2

Analysis	Comments About Results For This Analysis
	No comments regarding analyses for this ASR.

CHAIN OF CUSTODY RECORD
ENVIRONMENTAL PROTECTION AGENCY REGION VII

SAMPLES WERE Collected on August 31 AND September 1, 1999

ACTIVITY LEADER(Print)	NAME OF SURVEY OR ACTIVITY	DATE OF COLLECTION (DAY / MONTH / YEAR)	SHEET
GRISOLANO	HAWKEYE CASTINGS (CAT #2)	SEE ABOVE	1 of 1

CONTENTS OF SHIPMENT

SAMPLE NUMBER	TYPE OF CONTAINERS: CUBITAINER	8 oz BOTTLE	BOTTLE	BOTTLE	VOA SET (2 VIALS EA)	SAMPLED MEDIA: water	soil	sediment	dust	other	RECEIVING LABORATORY REMARKS/OTHER INFORMATION (condition of samples upon receipt, other sample numbers, etc.)
	NUMBERS OF CONTAINERS PER SAMPLE NUMBER										
002		1					✓				
003		1					✓				
004		1					✓				

SEE FIELD Sheets for details (MAP Attached)

Note Sample #001 WAS NOT Collected @ this time due to 30-day Waiting Period following INSTALLATION of new monitoring wells. GW Sample #001 will be collected in October 1999

Jim Caldwell

* This 30-day Waiting Period is a requirement of the EPA-Approved Work Plan

DESCRIPTION OF SHIPMENT	MODE OF SHIPMENT
____ PIECE(S) CONSISTING OF ____ BOX(ES)	✓ COMMERCIAL CARRIER: FED-EX
1 ICE CHEST(S); OTHER ____	____ COURIER
	____ SAMPLER CONVEYED
	812427085608 (SHIPPING DOCUMENT NUMBER)

PERSONNEL CUSTODY RECORD

RELINQUISHED BY (SAMPLER)	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
Jim Caldwell ☑ SEALED ☐ UNSEALED	9/7/99	10:15	☐ SEALED ☐ UNSEALED	
RELINQUISHED BY ☐ SEALED ☐ UNSEALED	DATE	TIME	RECEIVED BY ☐ SEALED ☐ UNSEALED	REASON FOR CHANGE OF CUSTODY
RELINQUISHED BY ☐ SEALED ☐ UNSEALED	DATE	TIME	RECEIVED BY ☐ SEALED ☐ UNSEALED	REASON FOR CHANGE OF CUSTODY

7-EPA-9262(Revised 5/85)

AL FIELD SHEET

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII

ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

Y: 99 ACTNO: CAT02 SAMNO: 002 QCC: _ MEDIA: SOIL PL: ARTD PROGRAM

IVITY DES: HAWKEYE CASTINGS REF LATITUDE: __ __ __

ATION: MANCHESTER IA PROJECT NUM: A52 PT: LONGITUDE: __ __ __

PLE DES: Soil

ATION: Manchester IA

ASE/BATCH/SMO: ____/_/______ LAB: ___

TORET/AIRS NO: ______

	DATE	TIME	FROM REF PT	
BEG:	8/31/99	1:50	EAST:	____
END:	__/__/__	__:__	NORTH:	____
			DOWN:	____

LYSIS REQUESTED:

ONTAINER	PRESERVATIVE	MGP	NAME
Z GLASS	COOL (4 C)	SM14	LEAD, TOTAL, BY ICAP
Z GLASS	NONE	SG07	SOLIDS, PERCENT

MENTS: FOR SUPERFUND ONLY: SUBSITE IDENTIFIER:___ OPERABLE UNIT:___

(JPC 8/31/99)

S-3 Surface Soil (0-6") Collected from Northwest Corner of Secondary disposal Area, Approximately 300 feet West of Hawkeye Castings foundry building

SEE Attached Map

AMPLE COLLECTED BY : [signature]

INAL

FIELD SHEET
U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

99 ACTNO: CAT02 SAMNO: 003 QCC: _ MEDIA: SOIL PL: ARTD PROGRAM

ACTIVITY DES: HAWKEYE CASTINGS REF LATITUDE: __ __ __
LOCATION: MANCHESTER IA PROJECT NUM: A52 PT: LONGITUDE: __ __ __

SAMPLE DES: Soil
LOCATION: Hawkeye Castings Manchester IA
SE/BATCH/SMO: ____/__/____ LAB: ___
RET/AIRS NO: _____

	DATE	TIME	FROM REF PT
BEG:	8/31/89	1:05	EAST: ____
END:	__/__/__	__:__	NORTH: ____
			DOWN: ____

ALYSIS REQUESTED:

NTAINER	PRESERVATIVE	MGP	NAME
8 OZ GLASS	COOL (4 C)	SM14	LEAD, TOTAL, BY ICAP
8 OZ GLASS	NONE	SG07	SOLIDS, PERCENT

COMMENTS: FOR SUPERFUND ONLY: SUBSITE IDENTIFIER:___ OPERABLE UNIT:___

S-10-2 Subsurface Soil — SEE ATTACHED MAP

THIS Sample WAS TO HAVE been collected from LOCATION S-10 (NEAR primary foundry SAND Disposal Area). *However, Poor Sample recovery due to subsurface conditions prevented collection of A Sample AT this LOCATION. *As An Alternative, This Sample WAS collected from LOCATION S-12 SOUTHEAST of the HAWKEYE CASTINGS BUILDING AND NEXT TO the ephemeral Stream THAT runs ALONG the South Property BOUNDARY

SAMPLE COLLECTED BY : _____

NAL

FIELD SHEET
U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

: 99 ACTNO: CAT02 SAMNO: 004 QCC: _ MEDIA: SOIL PL: ARTD PROGRAM

CTIVITY DES: HAWKEYE CASTINGS REF LATITUDE: __ __ __
CATION: MANCHESTER IA PROJECT NUM: A52 PT: LONGITUDE: __ __ __

SAMPLE DES: Soil
CATION: _____ IA BEG: 9/1/99 11:15 EAST: _____
SE/BATCH/SMO: ____/__/____ LAB: ___ END: __/__/__ __:__ NORTH: _____
STORET/AIRS NO: _____ DOWN: _____

ALYSIS REQUESTED:

CONTAINER	PRESERVATIVE	MGP	NAME
8 OZ GLASS	COOL (4 C)	SM51	LEAD, TCLP

COMMENTS: FOR SUPERFUND ONLY: SUBSITE IDENTIFIER:___ OPERABLE UNIT:___

S-10-1 "foundry Sand"

Numerous Attempts Were MADE TO Collect A Sample of foundry Sand from this Sample Location. Three (3) Samples Were collected by use of A "LASKY-TYPE" Sampling device on 8/31/99. However, none of the 3 Samples WAS A full core recovery. A 4th Attempt WAS MADE on 9/1/99 — Unsuccessful. At this point, The Sample of foundry SAND WAS collected / CONTAINERIZED / Preserved from one of the Soil Cores Previously Collected on 8/31.

SEE ATTACHED MAP

SAMPLE COLLECTED BY : [signature]

Appendix F

Soil and Groundwater Analytical Reports
Closure Activities 3 May 2000

TestAmerica
INCORPORATED

ANALYTICAL REPORT

Carol Wilson
CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

05/24/2000

PROJECT #98-022

Date Received: 05/05/2000
Job Number: 00.05525

	Result	Units	Date Taken	Date Analyzed	Analyst	Analysis Method
563160 C-11-4						
ICP Metals Prep (Solid)	1.030	g	05/03/2000	05/05/2000	tlz	
ICP Metals-Solid	Complete	mg/kg	05/03/2000	05/09/2000	llw	SW 6010B
Lead, ICP	10	mg/kg	05/03/2000	05/09/2000	llw	SW 6010B
563161 S-7-3						
Solid pH Measured in Water	8.2	units	05/03/2000	05/08/2000	sas	SW 9045
Solids, Total	91.30	%	05/03/2000	05/08/2000	sas	SM 2540 G
TCLP - Mercury	<0.0020	mg/L	05/03/2000	05/23/2000	lmc	SW 7470
ICP TCLP METALS			05/03/2000			
TCLP Lead (ICP)	1.0	mg/L	05/03/2000	05/15/2000	llw	SW 6010B
563162 S-11-3						
Solid pH Measured in Water	7.8	units	05/03/2000	05/08/2000	sas	SW 9045
Solids, Total	92.43	%	05/03/2000	05/08/2000	sas	SM 2540 G
TCLP - Mercury	<0.0020	mg/L	05/03/2000	05/23/2000	lmc	SW 7470
ICP TCLP METALS			05/03/2000			
TCLP Lead (ICP)	4.3	mg/L	05/03/2000	05/15/2000	llw	SW 6010B
563163 MW-1						
Mercury,Cold Vapor	<0.00020	mg/L	05/03/2000	05/09/2000	lmc	EPA 245.1

Kristin Clay

Kristin M. Clay
Operations Manager
Iowa Lab Certification - 7

TestAmerica
INCORPORATED

ANALYTICAL REPORT

Carol Wilson
CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

05/24/2000

PROJECT #98-022

Date Received: 05/05/2000
Job Number: 00.05525

	Result	Units	Date Taken	Date Analyzed	Analyst	Analysis Method
563152 C-7-1						
ICP Metals Prep (Solid)	1.055	g	05/03/2000	05/05/2000	tlz	
ICP Metals-Solid	Complete	mg/kg	05/03/2000	05/09/2000	llw	SW 6010B
Lead, ICP	56	mg/kg	05/03/2000	05/09/2000	llw	SW 6010B
563153 C-7-1D						
ICP Metals Prep (Solid)	1.013	g	05/03/2000	05/05/2000	tlz	
ICP Metals-Solid	Complete	mg/kg	05/03/2000	05/09/2000	llw	SW 6010B
Lead, ICP	59	mg/kg	05/03/2000	05/09/2000	llw	SW 6010B
563154 C-7-2						
ICP Metals Prep (Solid)	1.020	g	05/03/2000	05/05/2000	tlz	
ICP Metals-Solid	Complete	mg/kg	05/03/2000	05/09/2000	llw	SW 6010B
Lead, ICP	92	mg/kg	05/03/2000	05/09/2000	llw	SW 6010B
563155 C-7-3						
ICP Metals Prep (Solid)	1.016	g	05/03/2000	05/05/2000	tlz	
ICP Metals-Solid	Complete	mg/kg	05/03/2000	05/09/2000	llw	SW 6010B
Lead, ICP	61	mg/kg	05/03/2000	05/09/2000	llw	SW 6010B

Kristin Clay

Kristin M. Clay
Operations Manager
Iowa Lab Certification - 7

TestAmerica
INCORPORATED

ANALYTICAL REPORT

Carol Wilson
CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

05/24/2000

PROJECT #98-022

Date Received: 05/05/2000
Job Number: 00.05525

	Result	Units	Date Taken	Date Analyzed	Analyst	Analysis Method
563156 C-7-4						
ICP Metals Prep (Solid)	1.023	g	05/03/2000	05/05/2000	tlz	
ICP Metals-Solid	Complete	mg/kg	05/03/2000	05/09/2000	llw	SW 6010B
Lead, ICP	210	mg/kg	05/03/2000	05/09/2000	llw	SW 6010B
563157 C-11-1						
ICP Metals Prep (Solid)	1.030	g	05/03/2000	05/05/2000	tlz	
ICP Metals-Solid	Complete	mg/kg	05/03/2000	05/09/2000	llw	SW 6010B
Lead, ICP	110	mg/kg	05/03/2000	05/09/2000	llw	SW 6010B
563158 C-11-2						
ICP Metals Prep (Solid)	1.007	g	05/03/2000	05/05/2000	tlz	
ICP Metals-Solid	Complete	mg/kg	05/03/2000	05/09/2000	llw	SW 6010B
Lead, ICP	380	mg/kg	05/03/2000	05/09/2000	llw	SW 6010B
563159 C-11-3						
ICP Metals Prep (Solid)	1.029	g	05/03/2000	05/05/2000	tlz	
ICP Metals-Solid	Complete	mg/kg	05/03/2000	05/09/2000	llw	SW 6010B
Lead, ICP	420	mg/kg	05/03/2000	05/09/2000	llw	SW 6010B

Kristin Clay

Kristin M. Clay
Operations Manager
Iowa Lab Certification - 7

TestAmerica
INCORPORATED

ANALYTICAL REPORT

Carol Wilson
CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

05/24/2000

PROJECT #98-022

Date Received: 05/05/2000
Job Number: 00.05525

	Result	Units	Date Taken	Date Analyzed	Analyst	Analysis Method
563163 MW-1						
ICP Metals - SW-6010B	Complete		05/03/2000	05/09/2000	llw	SW 6010B
Arsenic, ICP	0.101	mg/L	05/03/2000	05/09/2000	llw	SW 6010B
Barium, ICP	0.584	mg/L	05/03/2000	05/09/2000	llw	SW 6010B
Cadmium, ICP	0.029	mg/L	05/03/2000	05/09/2000	llw	SW 6010B
Chromium, ICP	0.065	mg/L	05/03/2000	05/09/2000	llw	SW 6010B
Lead, ICP	<0.10	mg/L	05/03/2000	05/09/2000	llw	SW 6010B
Selenium, ICP	<0.15	mg/L	05/03/2000	05/09/2000	llw	SW 6010B
Silver, ICP	<0.020	mg/L	05/03/2000	05/09/2000	llw	SW 6010B
563164 MW-2						
Mercury,Cold Vapor	0.00024	mg/L	05/03/2000	05/09/2000	lmc	EPA 245.1
ICP Metals - SW-6010B	Complete		05/03/2000	05/09/2000	llw	SW 6010B
Arsenic, ICP	<0.080	mg/L	05/03/2000	05/09/2000	llw	SW 6010B
Barium, ICP	0.498	mg/L	05/03/2000	05/09/2000	llw	SW 6010B
Cadmium, ICP	0.032	mg/L	05/03/2000	05/09/2000	llw	SW 6010B
Chromium, ICP	0.224	mg/L	05/03/2000	05/09/2000	llw	SW 6010B
Lead, ICP	<0.10	mg/L	05/03/2000	05/09/2000	llw	SW 6010B
Selenium, ICP	<0.15	mg/L	05/03/2000	05/09/2000	llw	SW 6010B
Silver, ICP	<0.020	mg/L	05/03/2000	05/09/2000	llw	SW 6010B

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TestAmerica
INCORPORATED

ANALYTICAL REPORT

Carol Wilson
CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

05/24/2000

PROJECT #98-022

Date Received: 05/05/2000
Job Number: 00.05525

	Result	Units	Date Taken	Date Analyzed	Analyst	Analysis Method
563165 MW-3						
Mercury,Cold Vapor	<0.00020	mg/L	05/03/2000	05/09/2000	lmc	EPA 245.1
ICP Metals - SW-6010B	Complete		05/03/2000	05/09/2000	llw	SW 6010B
Arsenic, ICP	<0.080	mg/L	05/03/2000	05/09/2000	llw	SW 6010B
Barium, ICP	0.285	mg/L	05/03/2000	05/09/2000	llw	SW 6010B
Cadmium, ICP	<0.020	mg/L	05/03/2000	05/09/2000	llw	SW 6010B
Chromium, ICP	0.036	mg/L	05/03/2000	05/09/2000	llw	SW 6010B
Lead, ICP	0.38	mg/L	05/03/2000	05/09/2000	llw	SW 6010B
Selenium, ICP	<0.15	mg/L	05/03/2000	05/09/2000	llw	SW 6010B
Silver, ICP	<0.020	mg/L	05/03/2000	05/09/2000	llw	SW 6010B
563166 MW-3D						
Mercury,Cold Vapor	<0.00020	mg/L	05/03/2000	05/09/2000	lmc	EPA 245.1
ICP Metals - SW-6010B	Complete		05/03/2000	05/09/2000	llw	SW 6010B
Arsenic, ICP	<0.080	mg/L	05/03/2000	05/09/2000	llw	SW 6010B
Barium, ICP	0.265	mg/L	05/03/2000	05/09/2000	llw	SW 6010B
Cadmium, ICP	<0.020	mg/L	05/03/2000	05/09/2000	llw	SW 6010B
Chromium, ICP	0.031	mg/L	05/03/2000	05/09/2000	llw	SW 6010B
Lead, ICP	0.31	mg/L	05/03/2000	05/09/2000	llw	SW 6010B
Selenium, ICP	<0.15	mg/L	05/03/2000	05/09/2000	llw	SW 6010B
Silver, ICP	0.030	mg/L	05/03/2000	05/09/2000	llw	SW 6010B

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TestAmerica
INCORPORATED

ANALYTICAL REPORT

Carol Wilson
CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

05/24/2000

Date Received: 05/05/2000
Job Number: 00.05525

	Result	Units	Date Taken	Date Analyzed	Analyst	Analysis Method
563167 MW-4						
Mercury,Cold Vapor	<0.00020	mg/L	05/03/2000	05/09/2000	lmc	EPA 245.1
ICP Metals - SW-6010B	Complete		05/03/2000	05/09/2000	llw	SW 6010B
Arsenic, ICP	<0.080	mg/L	05/03/2000	05/09/2000	llw	SW 6010B
Barium, ICP	0.175	mg/L	05/03/2000	05/09/2000	llw	SW 6010B
Cadmium, ICP	<0.020	mg/L	05/03/2000	05/09/2000	llw	SW 6010B
Chromium, ICP	0.049	mg/L	05/03/2000	05/09/2000	llw	SW 6010B
Lead, ICP	<0.10	mg/L	05/03/2000	05/09/2000	llw	SW 6010B
Selenium, ICP	<0.15	mg/L	05/03/2000	05/09/2000	llw	SW 6010B
Silver, ICP	<0.020	mg/L	05/03/2000	05/09/2000	llw	SW 6010B

Kristin Clay

Kristin M. Clay
Operations Manager
Iowa Lab Certification - 7

TestAmerica
INCORPORATED

QUALITY CONTROL REPORT

CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

05/24/2000

Job Number: 00.05525

Carol Wilson

Enclosed is the Quality Control data for the following samples submitted to TestAmerica, Inc. - Cedar Falls for analysis:

Sample Number	Sample Description	Date Taken	Date Received
563152	C-7-1	05/03/2000	05/05/2000
563153	C-7-1D	05/03/2000	05/05/2000
563154	C-7-2	05/03/2000	05/05/2000
563155	C-7-3	05/03/2000	05/05/2000
563156	C-7-4	05/03/2000	05/05/2000
563157	C-11-1	05/03/2000	05/05/2000
563158	C-11-2	05/03/2000	05/05/2000
563159	C-11-3	05/03/2000	05/05/2000
563160	C-11-4	05/03/2000	05/05/2000
563161	S-7-3	05/03/2000	05/05/2000
563162	S-11-3	05/03/2000	05/05/2000
563163	MW-1	05/03/2000	05/05/2000
563164	MW-2	05/03/2000	05/05/2000
563165	MW-3	05/03/2000	05/05/2000
563166	MW-3D	05/03/2000	05/05/2000
563167	MW-4	05/03/2000	05/05/2000

This Quality Control report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

TestAmerica
INCORPORATED

QUALITY CONTROL REPORT

CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

05/24/2000

Carol Wilson

Job Number: 00.05525

			Date Analyzed	Prep Batch Number	Run Batch Number	Analysis Method	Reporting Limit
563152 C-7-1							05/03/2000
ICP Metals Prep (Solid)	1.055	g	05/05/2000	849			
ICP Metals-Solid	Complete	mg/kg	05/09/2000		1010	SW 6010B	
Lead, ICP	56	mg/kg	05/09/2000	849	1007	SW 6010B	5.0
563153 C-7-1D							05/03/2000
ICP Metals Prep (Solid)	1.013	g	05/05/2000	849			
ICP Metals-Solid	Complete	mg/kg	05/09/2000		1010	SW 6010B	
Lead, ICP	59	mg/kg	05/09/2000	849	1007	SW 6010B	5.0
563154 C-7-2							05/03/2000
ICP Metals Prep (Solid)	1.020	g	05/05/2000	849			
ICP Metals-Solid	Complete	mg/kg	05/09/2000		1010	SW 6010B	
Lead, ICP	92	mg/kg	05/09/2000	849	1007	SW 6010B	5.0
563155 C-7-3							05/03/2000
ICP Metals Prep (Solid)	1.016	g	05/05/2000	849			
ICP Metals-Solid	Complete	mg/kg	05/09/2000		1010	SW 6010B	
Lead, ICP	61	mg/kg	05/09/2000	849	1007	SW 6010B	5.0
563156 C-7-4							05/03/2000
ICP Metals Prep (Solid)	1.023	g	05/05/2000	849			
ICP Metals-Solid	Complete	mg/kg	05/09/2000		1010	SW 6010B	
Lead, ICP	210	mg/kg	05/09/2000	849	1007	SW 6010B	5.0

TestAmerica
INCORPORATED

QUALITY CONTROL REPORT

CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

05/24/2000

Carol Wilson

Job Number: 00.05525

			Date Analyzed	Prep Batch Number	Run Batch Number	Analysis Method	Reporting Limit
563157 C-11-1							05/03/2000
ICP Metals Prep (Solid)	1.030	g	05/05/2000	849			
ICP Metals-Solid	Complete	mg/kg	05/09/2000		1010	SW 6010B	
Lead, ICP	110	mg/kg	05/09/2000	849	1007	SW 6010B	5.0
563158 C-11-2							05/03/2000
ICP Metals Prep (Solid)	1.007	g	05/05/2000	849			
ICP Metals-Solid	Complete	mg/kg	05/09/2000		1010	SW 6010B	
Lead, ICP	380	mg/kg	05/09/2000	849	1007	SW 6010B	5.0
563159 C-11-3							05/03/2000
ICP Metals Prep (Solid)	1.029	g	05/05/2000	849			
ICP Metals-Solid	Complete	mg/kg	05/09/2000		1010	SW 6010B	
Lead, ICP	420	mg/kg	05/09/2000	849	1007	SW 6010B	5.0
563160 C-11-4							05/03/2000
ICP Metals Prep (Solid)	1.030	g	05/05/2000	849			
ICP Metals-Solid	Complete	mg/kg	05/09/2000		1010	SW 6010B	
Lead, ICP	10	mg/kg	05/09/2000	849	1007	SW 6010B	5.0
563161 S-7-3							05/03/2000
Solid pH Measured in Water	8.2	units	05/08/2000		1041	SW 9045	0.1
Solids, Total	91.30	%	05/08/2000		1652	SM 2540 G	0.01
TCLP - Mercury	<0.0020	mg/L	05/23/2000		686	SW 7470	0.0020

ICP TCLP METALS.

TestAmerica
INCORPORATED

QUALITY CONTROL REPORT

CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

05/24/2000

Carol Wilson

Job Number: 00.05525

			Date Analyzed	Prep Batch Number	Run Batch Number	Analysis Method	Reporting Limit
563161 S-7-3							05/03/2000
TCLP Lead (ICP)	1.0	mg/L	05/15/2000	1376	1169	SW 6010B	0.10
563162 S-11-3							05/03/2000
Solid pH Measured in Water	7.8	units	05/08/2000		1041	SW 9045	0.1
Solids, Total	92.43	%	05/08/2000		1652	SM 2540 G	0.01
TCLP - Mercury	<0.0020	mg/L	05/23/2000		686	SW 7470	0.0020
ICP TCLP METALS							
TCLP Lead (ICP)	4.3	mg/L	05/15/2000	1376	1169	SW 6010B	0.10
563163 MW-1							05/03/2000
Mercury,Cold Vapor	<0.00020	mg/L	05/09/2000		1647	EPA 245.1	0.00020
ICP Metals - SW-6010B	Complete		05/09/2000		2602	SW 6010B	
Arsenic, ICP	0.101	mg/L	05/09/2000	1989	2871	SW 6010B	0.080
Barium, ICP	0.584	mg/L	05/09/2000	1989	2905	SW 6010B	0.010
Cadmium, ICP	0.029	mg/L	05/09/2000	1989	2917	SW 6010B	0.020
Chromium, ICP	0.065	mg/L	05/09/2000	1989	2918	SW 6010B	0.020
Lead, ICP	<0.10	mg/L	05/09/2000	1989	2887	SW 6010B	0.10
Selenium, ICP	<0.15	mg/L	05/09/2000	1989	2865	SW 6010B	0.15
Silver, ICP	<0.020	mg/L	05/09/2000	1989	2912	SW 6010B	0.020
563164 MW-2							05/03/2000
Mercury,Cold Vapor	0.00024	mg/L	05/09/2000		1647	EPA 245.1	0.00020
ICP Metals - SW-6010B	Complete		05/09/2000		2602	SW 6010B	
Arsenic, ICP	<0.080	mg/L	05/09/2000	1989	2871	SW 6010B	0.080
Barium, ICP	0.498	mg/L	05/09/2000	1989	2905	SW 6010B	0.010
Cadmium, ICP	0.032	mg/L	05/09/2000	1989	2917	SW 6010B	0.020

TestAmerica
INCORPORATED

QUALITY CONTROL REPORT

CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

05/24/2000

Carol Wilson

Job Number: 00.05525

			Date Analyzed	Prep Batch Number	Run Batch Number	Analysis Method	Reporting Limit
563164 MW-2							05/03/2000
Chromium, ICP	0.224	mg/L	05/09/2000	1989	2918	SW 6010B	0.020
Lead, ICP	<0.10	mg/L	05/09/2000	1989	2887	SW 6010B	0.10
Selenium, ICP	<0.15	mg/L	05/09/2000	1989	2865	SW 6010B	0.15
Silver, ICP	<0.020	mg/L	05/09/2000	1989	2912	SW 6010B	0.020
563165 MW-3							05/03/2000
Mercury,Cold Vapor	<0.00020	mg/L	05/09/2000		1647	EPA 245.1	0.00020
ICP Metals - SW-6010B	Complete		05/09/2000		2602	SW 6010B	
Arsenic, ICP	<0.080	mg/L	05/09/2000	1989	2871	SW 6010B	0.080
Barium, ICP	0.285	mg/L	05/09/2000	1989	2905	SW 6010B	0.010
Cadmium, ICP	<0.020	mg/L	05/09/2000	1989	2917	SW 6010B	0.020
Chromium, ICP	0.036	mg/L	05/09/2000	1989	2918	SW 6010B	0.020
Lead, ICP	0.38	mg/L	05/09/2000	1989	2887	SW 6010B	0.10
Selenium, ICP	<0.15	mg/L	05/09/2000	1989	2865	SW 6010B	0.15
Silver, ICP	<0.020	mg/L	05/09/2000	1989	2912	SW 6010B	0.020
563166 MW-3D							05/03/2000
Mercury,Cold Vapor	<0.00020	mg/L	05/09/2000		1647	EPA 245.1	0.00020
ICP Metals - SW-6010B	Complete		05/09/2000		2602	SW 6010B	
Arsenic, ICP	<0.080	mg/L	05/09/2000	1989	2871	SW 6010B	0.080
Barium, ICP	0.265	mg/L	05/09/2000	1989	2905	SW 6010B	0.010
Cadmium, ICP	<0.020	mg/L	05/09/2000	1989	2917	SW 6010B	0.020
Chromium, ICP	0.031	mg/L	05/09/2000	1989	2918	SW 6010B	0.020
Lead, ICP	0.31	mg/L	05/09/2000	1989	2887	SW 6010B	0.10
Selenium, ICP	<0.15	mg/L	05/09/2000	1989	2865	SW 6010B	0.15
Silver, ICP	0.030	mg/L	05/09/2000	1989	2912	SW 6010B	0.020

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QUALITY CONTROL REPORT

CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

05/24/2000

Carol Wilson

Job Number: 00.05525

			Date Analyzed	Prep Batch Number	Run Batch Number	Analysis Method	Reporting Limit
563167 MW-4						05/03/2000	
Mercury,Cold Vapor	<0.00020	mg/L	05/09/2000		1647	EPA 245.1	0.00020
ICP Metals - SW-6010B	Complete		05/09/2000		2602	SW 6010B	
Arsenic, ICP	<0.080	mg/L	05/09/2000	1989	2871	SW 6010B	0.080
Barium, ICP	0.175	mg/L	05/09/2000	1989	2905	SW 6010B	0.010
Cadmium, ICP	<0.020	mg/L	05/09/2000	1989	2917	SW 6010B	0.020
Chromium, ICP	0.049	mg/L	05/09/2000	1989	2918	SW 6010B	0.020
Lead, ICP	<0.10	mg/L	05/09/2000	1989	2887	SW 6010B	0.10
Selenium, ICP	<0.15	mg/L	05/09/2000	1989	2865	SW 6010B	0.15
Silver, ICP	<0.020	mg/L	05/09/2000	1989	2912	SW 6010B	0.020

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INCORPORATED

QUALITY CONTROL REPORT
BLANKS

CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

05/24/2000

Carol Wilson

Job Number: 00.05525

Analyte	Prep Batch Number	Run Batch Number	Blank Analysis	Units	Date Analyzed	Analyst
Mercury,Cold Vapor		1647	<0.00020	mg/L	05/09/2000	lmc
Lead, ICP	849	1007	<0.10	mg/L	05/09/2000	llw
Arsenic, ICP	1989	2871	<0.080	mg/L	05/09/2000	llw
Barium, ICP	1989	2905	<0.010	mg/L	05/09/2000	llw
Cadmium, ICP	1989	2917	<0.020	mg/L	05/09/2000	llw
Chromium, ICP	1989	2918	<0.020	mg/L	05/09/2000	llw
Lead, ICP	1989	2887	<0.10	mg/L	05/09/2000	llw
Selenium, ICP	1989	2865	<0.15	mg/L	05/09/2000	llw
Silver, ICP	1989	2912	<0.020	mg/L	05/09/2000	llw
TCLP - Mercury		686	<0.0020	mg/L	05/23/2000	lmc
TCLP Lead (ICP)	1376	1169	<0.10	mg/L	05/15/2000	llw

NA - Not Applicable

Advisory Control Limits for Blanks:
Metals/Wet Chemistry/ Conventionals/GC - all compounds should be less than the Reporting Limit.
GC/MS - Semi-Volatiles - all compounds should be less than the Reporting Limit except for phthalates which should be less than 5 times the reporting limit.
Volatiles - Toluene, methylene chloride, acetone and chloroform should be less than 5 times the Reporting Limit. All other volatile compounds should be less than the Reporting Limit.

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QUALITY CONTROL REPORT
STANDARDS

CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

05/24/2000

Carol Wilson

Job Number: 00.05525

Analyte	Prep Batch Number	Run Batch Number	CCV % Recovery	LCS % Recovery	Analyst
Solid pH Measured in Water		1041	102.0		
Mercury,Cold Vapor		1647	98.0	97.0	lmc
Mercury,Cold Vapor		1647	97.0		
ICP Metals-Solid		1010	100.0		
Lead, ICP	849	1007	96.4	91.0	llw
Lead, ICP		1007	95.8		
ICP Metals - SW-6010B		2602			
Arsenic, ICP	1989	2871	99.6	100.0	llw
Barium, ICP	1989	2905	96.8	99.0	llw
Cadmium, ICP	1989	2917	98.8	100.0	llw
Chromium, ICP	1989	2918	98.8	99.0	llw
Lead, ICP	1989	2887	97.6	99.0	llw
Selenium, ICP	1989	2865	99.0	99.5	llw
Silver, ICP	1989	2912	90.0	95.0	llw
TCLP - Mercury		686	99.0	101.2	lmc
ICP TCLP METALS					
TCLP Lead (ICP)	1376	1169	103.4	98.0	llw

CCV - Continuing Calibration Verification
LCS - Laboratory Control Standard
NA - Not Applicable

TestAmerica
INCORPORATED

QUALITY CONTROL REPORT
DUPLICATES/SPIKES

CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

05/24/2000

Carol Wilson

Job Number: 00.05525

Analyte	Prep Batch Number	Run Batch Number	Original Analysis	Duplicate Analysis	Units	RPD	Spike Result	Units	Percent Recovery
Solid pH Measured in Water		1041	8.2	8.2	units	0.0			
Solids, Total		1652	91.30	88.79	%	2.8			
Solids, Total		1652	30.15	30.02	%	0.4			
TCLP - Mercury							0.0172	mg/L	103.0
TCLP - Mercury							0.0171	mg/L	102.4
ICP TCLP METALS									
TCLP Lead (ICP)	1376						1.72	mg/L	86.0
TCLP Lead (ICP)	1376						2.93	mg/L	96.5
TCLP Lead (ICP)	1376						2.00	mg/L	79.0

NOTE: Spikes and Duplicates may not be samples from this job.

NA - Not Applicable
RPD - Relative Percent Difference

Advisory Control Limits for Duplicates - RPD should be less than 20.

Advisory Control Limits for Spikes - Spike recovery should be 75 - 125%.

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QUALITY CONTROL REPORT
MATRIX SPIKE/MATRIX SPIKE DUPLICATE

CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

05/24/2000

Carol Wilson

Job Number: 00.05525

Analyte	Prep Batch Number	Run Batch Number	Analysis Result	Units	MS Result	MS % Recovery	MSD Result	MSD % Recovery	MS/MSD RPD
Mercury,Cold Vapor		1647	<0.00020	mg/L	0.00165	98.8	0.00164	98.2	0.6
ICP Metals-Solid		1010	Complete	mg/kg					
Lead, ICP	849	1007	140	mg/kg	480	89.5	480	90.2	0.0
ICP Metals - SW-6010B		2602	Complete						
Arsenic, ICP	1989	2871	<0.080	mg/L	2.09	104.5	2.08	104.0	0.5
Barium, ICP	1989	2905	0.015	mg/L	1.00	98.5	1.00	98.5	0.0
Cadmium, ICP	1989	2917	<0.020	mg/L	0.99	99.0	0.98	98.0	1.0
Chromium, ICP	1989	2918	<0.020	mg/L	0.99	99.0	0.99	99.0	0.0
Lead, ICP	1989	2887	<0.10	mg/L	1.94	97.0	1.94	97.0	0.0
Selenium, ICP	1989	2865	<0.15	mg/L	4.09	102.3	4.05	101.3	1.0
Silver, ICP	1989	2912	<0.020	mg/L	0.95	95.0			

NOTE: Matrix Spike Samples may not be samples from this job.

NA = Not Applicable
MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference

TestAmerica INCORPORATED

Falls[illegible]sion
704 Enterprise Drive
Cedar Falls, IA 50613

Phone: 319 - 277 - 2401 or 1 - 800 - 750 - 2401
Fax: 319 - 277 - 2425

Company: CHEM-ECO Environmental
Send Report To: Carol Wilson
Address: P.O. Box 367
City/State/Zip Code: Aramosa IA 52205
Telephone Number: 34 484 2618 Fax:
Sampled by: (Print Name) Carol Wilson
(Signature) Carol E Wilson

Your PO #:
Invoice To: CHEM-ECO
TA Quote #:
Project Name:
Project Number: 98-022
Project Manager:
Proj. Mgr. Telephone:

Sample ID	Date Sampled	Time Sampled	# of containers shipped	Grab	Composite	Field Filtered	Preservative: Ice	HNO_3 (Red & White Label)	HCl (Blue & White Label)	NaOH (Orange & White Label)	H_2SO_4 Plastic (Yellow & White Label)	H_2SO_4 Glass(Yellow & White Label)	None (Black & White Label)	Other (Specify)	Matrix: Groundwater	Wastewater	Drinking Water	Sludge	Soil	Other Specify:	Analyze For: Total lead	RUSH TAT (Must call ahead!)	Standard TAT	Fax Results	Send QC with report
C-7-1	5.3.00	2pm	1	✓			✓						✓						✓		✓				
C-7-1 D			1	✓			✓						✓						✓		✓				
C-7-2			1	✓			✓						✓						✓		✓				
C-7-3			1	✓			✓						✓						✓		✓				
C-7-4			1	✓			✓						✓						✓		✓				
C-11-1			1	✓			✓						✓						✓		✓				
C-11-2			1	✓			✓						✓						✓		✓				
C-11-3			1	✓			✓						✓						✓		✓				
C-11-4			1	✓			✓						✓						✓		✓				

NOTE: All turn around times are calculated from the time of receipt at TestAmerica.
NOTICE: **Pre-Arrangements must be made *AT LEAST 48 Hours in ADVANCE* to receive results with RUSH turn around time commitments; *additional charges* may be assessed.**
NOTE: There may be a charge assessed for TestAmerica disposing of sample remainders.

NOTES:

Relinquished by	Date	Time	Received by:	Date	Time	Relinquished by:	Date	Time
Carol E Wilson	5-4-00	4:20pm						
Shipped Via:			Comments:			Shipped Via:		
Received for TestAmerica by:	Date	Time	Temperature Upon Receipt:			Laboratory Comments:		
Edna Buelling	5-5-00	8:00						

TestAmerica INCORPORATED

[redacted] Falls [redacted]sion [redacted]
704 Enterprise Drive
Cedar Falls, IA 50613

[redacted] Phone: 319 - 277 - 2401 or [redacted] 1 - 800 - 750 - 2401
Fax: 319 - 277 - 2425

Company: CHEM-ECO Environmental
Send Report To: Carol Wilson
Address: P.O. Box 367
City/State/Zip Code: Anamosa Iowa 52205
Telephone Number: 319 484 2618 Fax:
Sampled by (Print Name): Carol Wilson
(Signature): Carol E Wilson

Your PO #:
Invoice To:
TA Quote #:
Project Name:
Project Number:
Project Manager:
Proj. Mgr. Telephone:

Sample ID	Date Sampled	Time Sampled	# of containers shipped	Grab	Composite	Field Filtered	Preservative: Ice	HNO_3 (Red & White Label)	HCl (Blue & White Label)	NaOH (Orange & White Label)	H_2SO_4 Plastic (Yellow & White Label)	H_2SO_4 Glass(Yellow & White Label)	None (Black & White Label)	Other (Specify)	Matrix: Groundwater	Wastewater	Drinking Water	Sludge	Soil	Other Specify:	Analyze For: TCLP lead	& RCRA metals	RUSH TAT (Must call ahead!)	Standard TAT	Fax Results	Send QC with report
S-7-3	5.3.00	2pm	1		✓		✓						✓						✓		✓					
S-11-3			1		✓		✓						✓						✓		✓					
MW-1			1	✓			✓	✓							✓							✓				
MW-2			1	✓			✓	✓							✓							✓				
MW-3			1	✓			✓	✓							✓							✓				
MW-3D			1	✓			✓	✓							✓							✓				
MW-4	↓	↓	1	✓			✓	✓							✓							✓				

NOTE: All turn around times are calculated from the time of receipt at TestAmerica.
NOTICE: **Pre-Arrangements must be made *AT LEAST 48 Hours in ADVANCE* to receive results with RUSH turn around time commitments; *additional charges* may be assessed.**
NOTE: There may be a charge assessed for TestAmerica disposing of sample remainders.

NOTES: & RCRA Metals = arsenic, barium, cadmium, chromium, lead, mercury, silver selenium.

Relinquished by	Date	Time	Received by:	Date	Time	Relinquished by:	Date	Time
Carol E Wilson	5.4.00	4:20 pm						
Shipped Via:			Comments:			Shipped Via:		
Received for TestAmerica by	Date	Time	Temperature Upon Receipt:	Laboratory Comments:				
Joshua Muehling	5-5-00	8:00						

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VII
901 NORTH 5TH STREET
KANSAS CITY, KANSAS 66101

JUN 0 9 2000

Dr. John Tyrrell
Hawkeye Castings, Inc/Tyrrell Investments, Inc.
410 North Franklin
Manchester, Iowa 52057

Dear Dr. Tyrrell:

RE: Analytical Results of Split Samples
Hawkeye Castings, Inc./a/k/a Tyrrell Investments, Inc.
Manchester, Iowa
EPA RCRA ID No. IAD984599589
Docket No. VII-97-H-0008

Enclosed you will find a copy of the analytical results for the groundwater samples that were collected at the referenced facility on March 5, 2000, by the U.S. Geological Survey, contractor to the U.S. Environmental Protection Agency.

If you have any questions regarding this information, please contact me at (913) 551-7657.

Sincerely,

Mary Reilly Grisolano, P.E.
Project Manager
RCRA Corrective Action and Permits Branch
Air, RCRA, and Toxics Division

Enclosure

cc: Liz Christiansen, Iowa Department of Natural Resources
Paul W. Johnson, Iowa Department of Natural Resources
Carol Wilson, Chemeco

United States Environmental Protection Agency

Region 7 Laboratory
25 Funston Road
Kansas City, KS 66115

Date: 6/1/2000

Subject: Transmittal of Sample Analysis Results for ASR #: 641
Activity Number: MLG03
Activity Description: Hawkeye Castings

From: Michael Thomas, Associate Laboratory Manager
Regional Laboratory, Environmental Services Division

To: Mary Grisolano
ARTD/RCAP

This is the sample analysis results transmittal for the above-referenced Analytical Services Request (ASR). The data contained in this transmittal have been approved by the Regional Laboratory. This transmittal contains all of the sample analysis results for this ASR. The Regional Laboratory should be notified within 14 days if any changes are needed to the contents of this report. If you have any questions, comments or data changes, please contact the Laboratory Customer Service Department at 913-551-5295.

cc: Analytical Data File

ASR Number: 641

Summary of Activity Information
6/1/2000

Activity Leader: Grisolano, Mary **Org:** ARTD/RCAP **Phone:** (913) 551-7657
Activity Number: MLG03
Activity Desc: Hawkeye Castings
Location: Hawkeye **State:** Iowa **Type:** RCRA

Purpose: Compliance monitoring

Explanation of Codes, Units and Qualifiers used on this report.

Sample QC Codes: QC Codes identify the type of sample for quality control purposes.

__ = Field Sample
FD = Field Duplicate

Units: Specific units in which results are reported.

ug/L = Micrograms per Liter

Data Qualifiers: Specific codes used in conjunction with data values to provide additional information on the quality of reported results, or used to explain the absence of a specific value.

(Blank) = Values have been reviewed and found acceptable for use.
U = Not detected at or above the reportable level shown.

Activity Number: MLG03 **ASR Number:** 641 **Sample Information Summary**

Activity Desc: Hawkeye Castings **6/1/2000**

Sample Number	QC Code	Matrix	Location	External Sample No.	Start Date	Start Time	End Date	End Time	Receipt Date
1	__	Water	Temporary Monitoring Well/MW-2		05/03/2000	10:40	05/03/2000		05/09/2000
1	FD	Water	Temporary Monitoring Well/MW - Duplicate location as sample 1		05/03/2000	10:40	05/03/2000		05/09/2000

Activity Number: MLG03 ASR Number: 641 RLAB Approved Analysis Comments

Activity Desc: Hawkeye Castings 6/1/2000

Analysis	Comments About Results For This Analysis
	No comments regarding analyses for this ASR.

Analysis / Analyte	Units	1-__	1-FD
Arsenic in Water by AA			
Arsenic	ug/L	58.7	61.8
Mercury in Water			
Mercury	ug/L	0.373	0.372
Selenium in Water by AA			
Selenium	ug/l	2.00 U	2.00 U
Total Metals Analysis of TCLP Metals in Water by ICAP			
Barium	ug/L	538	545
Cadmium	ug/L	6.63	4.69
Chromium	ug/L	238	243
Lead	ug/L	71.8	93.4
Silver	ug/L	25.0 U	25.0 U

RESAT

CHAIN OF CUSTODY RECORD
ENVIRONMENTAL PROTECTION AGENCY REGION VII

ACTIVITY LEADER(Print)	NAME OF SURVEY OR ACTIVITY	DATE OF COLLECTION (DAY / MONTH / YEAR)	SHEET
GRISOLANO	HAWKEYE CASTINGS	3 / 5 / ~~96~~ 00	1 of 1

CONTENTS OF SHIPMENT

SAMPLE NUMBER	TYPE OF CONTAINERS: CUBITAINER	BOTTLE	BOTTLE	BOTTLE	VOA SET (2 VIALS EA)	SAMPLED MEDIA: water	soil	sediment	dust	other	RECEIVING LABORATORY REMARKS/OTHER INFORMATION (condition of samples upon receipt, other sample numbers, etc.)
	NUMBERS OF CONTAINERS PER SAMPLE NUMBER										
ASR 641											
~~SAMN01~~	2					X					
~~SAMN01SD~~	1					X					

DESCRIPTION OF SHIPMENT

____ PIECE(S) CONSISTING OF ____ BOX(ES)

X ICE CHEST(S); OTHER _____

MODE OF SHIPMENT

X COMMERCIAL CARRIER: _____

____ COURIER

____ SAMPLER CONVEYED

812027086270 (SHIPPING DOCUMENT NUMBER)

PERSONNEL CUSTODY RECORD

5/9/00 10:10am

RELINQUISHED BY (SAMPLER)	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
[signature] X SEALED UNSEALED	1:00 5/8/00	1:00	[signature] X SEALED UNSEALED	[signature]
RELINQUISHED BY	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
SEALED UNSEALED			SEALED UNSEALED	
RELINQUISHED BY	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
SEALED UNSEALED			SEALED UNSEALED	

* MLG 03 / ASR 641

DRAFT

FIELD SHEET
U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

ACTNO: SAMNO: 1 QCC: MEDIA: WATER PL: DONA, B.

CTIVITY DES: HAWKEYE CASTINGS
CATION: MANCHESTER, IA IA PROJECT NUM: REF LATITUDE: PT: LONGITUDE:

AMPLE DES:
CATION: MANCHESTER IA
E/BATCH/SMO: / /
TORET/AIRS NO:

LAB:

	DATE	TIME	FROM REF PT
BEG:	5/3/[illegible]	10:[illegible]	EAST:
END:	5/3/[illegible]	:__	NORTH:
			DOWN:

NALYSIS REQUESTED:

CONTAINER	PRESERVATIVE	MGP	NAME
1 LITER (2)	HNO_3	~~W-TAT~~	8 RCRA METALS (~~SEE ASR ATTACHED~~)
COBIE			* LEAD BY ICAP BY AA (~~WATER~~)

COMMENTS: FOR SUPERFUND ONLY: SUBSITE IDENTIFIER: OPERABLE UNIT:

Temp. Monitoring Well MW-2

Collected 2 1-Liter Cubies

Added As by AA in Chemist 5/25/01

Hg yes

Total Metals yes of TCLP Met in Water

(No) on Se by ICP

Se by AA (yes)

SAMPLE COLLECTED BY :

* MLG03/ASR641

FIELD SHEET
U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VII
ENVIRONMENTAL SERVICES DIV. 25 FUNSTON RD. KANSAS CITY, KS 66115

ACTNO: SAMNO: 15D QCC: MEDIA: WATER PL: DONA, B.

TIVITY DES: HAWKEYE CASTINGS REF LATITUDE:
CATION: MANCHESTER, IA IA PROJECT NUM: PT: LONGITUDE: — — —

MPLE DES:
CATION: MANCHESTER IA DATE TIME FROM REF PT
S BATCH/SMO: ____/__/____ LAB: ___ BEG: 5/3/00 10:40 EAST: ____
ORET/AIRS NO: _____ END: 5/3/00 __:__ NORTH: ____
DOWN: ____

ALYSIS REQUESTED:
NTAINER PRESERVATIVE MGP NAME

1 LITER HNO_3 ~~WATER~~ 8 RCRA METALS (~~SEE ASR~~ ATTACHED)
CUBIE * LEAD BY ICAP BY AA (~~WATER~~)

MENTS: FOR SUPERFUND ONLY: SUBSITE IDENTIFIER:___ OPERABLE UNIT:___

Temp. Monitoring Well MW-2
Collected 1 1-LITER Cubie

See note on #1 field sheet + amended.
ASR. MB
5/16/00

MPLE COLLECTED BY: [signature]

Appendix G

Soil and Groundwater Analytical Reports
Closure Activities 17 October 2000

TestAmerica
INCORPORATED

ANALYTICAL REPORT

Carol Wilson
CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

11/01/2000

Date Received: 10/19/2000
Job Number: 00.13418

	Result	Units	Date Taken	Date Analyzed	Analyst	Analysis Method
589852 B-2-1 13-19" Project #98022						
ICP Metals Prep (Solid)	1.011	g	10/17/2000	10/23/2000	rmp	
ICP Metals-Solid	Complete	mg/kg	10/17/2000	10/24/2000	llw	SW 6010B
Lead, ICP	170	mg/kg	10/17/2000	10/24/2000	llw	SW 6010B
589853 B-2-2 10-15" Project #98022						
ICP Metals Prep (Solid)	1.004	g	10/17/2000	10/23/2000	rmp	
ICP Metals-Solid	Complete	mg/kg	10/17/2000	10/24/2000	llw	SW 6010B
Lead, ICP	61	mg/kg	10/17/2000	10/24/2000	llw	SW 6010B
589854 B-2-3 13-18" Project #98022						
ICP Metals Prep (Solid)	1.023	g	10/17/2000	10/23/2000	rmp	
ICP Metals-Solid	Complete	mg/kg	10/17/2000	10/24/2000	llw	SW 6010B
Lead, ICP	220	mg/kg	10/17/2000	10/24/2000	llw	SW 6010B
589855 B-2-3D 13-18" Project #98022						
ICP Metals Prep (Solid)	1.012	g	10/17/2000	10/23/2000	rmp	
ICP Metals-Solid	Complete	mg/kg	10/17/2000	10/24/2000	llw	SW 6010B
Lead, ICP	420	mg/kg	10/17/2000	10/24/2000	llw	SW 6010B

Kristin Clay
Kristin M. Clay
Operations Manager
Iowa Lab Certification - 7

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Anamosa, IA 52205

11/01/2000

Date Received: 10/19/2000
Job Number: 00.13418

	Result	Units	Date Taken	Date Analyzed	Analyst	Analysis Method
589856 B-2-4 14-19" Project #98022						
ICP Metals Prep (Solid)	1.030	g	10/17/2000	10/23/2000	rmp	
ICP Metals-Solid	Complete	mg/kg	10/17/2000	10/24/2000	llw	SW 6010B
Lead, ICP	540	mg/kg	10/17/2000	10/24/2000	llw	SW 6010B
589857 B-2-5 18-20" Project #98022						
ICP Metals Prep (Solid)	1.007	g	10/17/2000	10/23/2000	rmp	
ICP Metals-Solid	Complete	mg/kg	10/17/2000	10/24/2000	llw	SW 6010B
Lead, ICP	220	mg/kg	10/17/2000	10/24/2000	llw	SW 6010B
589858 B-2-6 18-20" (Floor) #98022						
ICP Metals Prep (Solid)	1.029	g	10/17/2000	10/23/2000	rmp	
ICP Metals-Solid	Complete	mg/kg	10/17/2000	10/24/2000	llw	SW 6010B
Lead, ICP	51	mg/kg	10/17/2000	10/24/2000	llw	SW 6010B
589859 B-3-1 15-21" Project #98022						
ICP Metals Prep (Solid)	1.001	g	10/17/2000	10/23/2000	rmp	
ICP Metals-Solid	Complete	mg/kg	10/17/2000	10/24/2000	llw	SW 6010B
Lead, ICP	12	mg/kg	10/17/2000	10/24/2000	llw	SW 6010B

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Anamosa, IA 52205

11/01/2000

Date Received: 10/19/2000
Job Number: 00.13418

	Result	Units	Date Taken	Date Analyzed	Analyst	Analysis Method
589860 B-3-2 13-19" Project #98022						
ICP Metals Prep (Solid)	1.008	g	10/17/2000	10/23/2000	rmp	
ICP Metals-Solid	Complete	mg/kg	10/17/2000	10/24/2000	llw	SW 6010B
Lead, ICP	15	mg/kg	10/17/2000	10/24/2000	llw	SW 6010B
589861 B-3-3 9-13" Project #98022						
ICP Metals Prep (Solid)	1.008	g	10/17/2000	10/23/2000	rmp	
ICP Metals-Solid	Complete	mg/kg	10/17/2000	10/24/2000	llw	SW 6010B
Lead, ICP	390	mg/kg	10/17/2000	10/24/2000	llw	SW 6010B
589862 B-3-4 14-20" Project #98022						
Lead	56	mg/kg	10/17/2000	10/31/2000	llw	SW 7420
ICP Metals Prep (Solid)	1.021	g	10/17/2000	10/24/2000	rmp	
589863 B-3-5 18-22" (Floor) #98022						
Lead	<5.0	mg/kg	10/17/2000	10/31/2000	llw	SW 7420
ICP Metals Prep (Solid)	1.000	g	10/17/2000	10/24/2000	rmp	
589864 B-3-6 14-20" (Floor) #98022						
Lead	6.2	mg/kg	10/17/2000	10/31/2000	llw	SW 7420

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Anamosa, IA 52205

11/01/2000

Date Received: 10/19/2000
Job Number: 00.13418

	Result	Units	Date Taken	Date Analyzed	Analyst	Analysis Method
589864 B-3-6 14-20" (Floor) #98022						
ICP Metals Prep (Solid)	1.014	g	10/17/2000	10/24/2000	rmp	
589865 B-3-6D 14-20" (Floor) #98022						
Lead	<5.0	mg/kg	10/17/2000	10/31/2000	llw	SW 7420
ICP Metals Prep (Solid)	1.011	g	10/17/2000	10/24/2000	rmp	
589866 B-4-1 18-24" Project #98022						
Lead	5.9	mg/kg	10/17/2000	10/31/2000	llw	SW 7420
ICP Metals Prep (Solid)	1.001	g	10/17/2000	10/24/2000	rmp	
589867 B-4-2 16-23" Project #98022						
Lead	11	mg/kg	10/17/2000	10/31/2000	llw	SW 7420
ICP Metals Prep (Solid)	1.015	g	10/17/2000	10/24/2000	rmp	
589868 B-4-3 19-26" Project #98022						
Lead	45	mg/kg	10/17/2000	10/31/2000	llw	SW 7420
ICP Metals Prep (Solid)	1.015	g	10/17/2000	10/24/2000	rmp	

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11/01/2000

Date Received: 10/19/2000
Job Number: 00.13418

	Result	Units	Date Taken	Date Analyzed	Analyst	Analysis Method
589869 B-4-4 20-25" Project #98022						
Lead	20	mg/kg	10/17/2000	10/31/2000	llw	SW 7420
ICP Metals Prep (Solid)	1.006	g	10/17/2000	10/24/2000	rmp	
589870 B-4-5 22-27" (Floor) #98022						
Lead	<5.0	mg/kg	10/17/2000	10/31/2000	llw	SW 7420
ICP Metals Prep (Solid)	1.019	g	10/17/2000	10/24/2000	rmp	
589871 B-5-1 16-23" Project #98022						
Lead	5.5	mg/kg	10/17/2000	10/31/2000	llw	SW 7420
ICP Metals Prep (Solid)	1.013	g	10/17/2000	10/24/2000	rmp	
589872 B-5-2 19-25" Project #98022						
Lead	<5.0	mg/kg	10/17/2000	10/31/2000	llw	SW 7420
ICP Metals Prep (Solid)	1.027	g	10/17/2000	10/24/2000	rmp	
589873 B-5-3 13-18" Project #98022						
Lead	6.4	mg/kg	10/17/2000	10/31/2000	llw	SW 7420
ICP Metals Prep (Solid)	1.005	g	10/17/2000	10/24/2000	rmp	

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11/01/2000

Date Received: 10/19/2000
Job Number: 00.13418

	Result	Units	Date Taken	Date Analyzed	Analyst	Analysis Method
589874 B-5-4 14-20" Project #98022						
Lead	7.6	mg/kg	10/17/2000	10/31/2000	llw	SW 7420
ICP Metals Prep (Solid)	1.015	g	10/17/2000	10/24/2000	rmp	
589875 B-5-5 18-25" (Floor) #98022						
Lead	<5.0	mg/kg	10/17/2000	10/31/2000	llw	SW 7420
ICP Metals Prep (Solid)	1.001	g	10/17/2000	10/24/2000	rmp	
589876 C-10-1 24-36" Project #98022						
Lead	19	mg/kg	10/17/2000	10/31/2000	llw	SW 7420
ICP Metals Prep (Solid)	1.003	g	10/17/2000	10/24/2000	rmp	
589877 C-10-1D 24-36" Project #98022						
Lead	16	mg/kg	10/17/2000	10/31/2000	llw	SW 7420
ICP Metals Prep (Solid)	1.023	g	10/17/2000	10/24/2000	rmp	
589878 C-10-2 29-35" Project #98022						
Lead	190	mg/kg	10/17/2000	10/31/2000	llw	SW 7420
ICP Metals Prep (Solid)	1.008	g	10/17/2000	10/24/2000	rmp	

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11/01/2000

Date Received: 10/19/2000
Job Number: 00.13418

	Result	Units	Date Taken	Date Analyzed	Analyst	Analysis Method
589879 C-10-3 22-30" Project #98022						
Lead	91	mg/kg	10/17/2000	10/31/2000	llw	SW 7420
ICP Metals Prep (Solid)	1.041	g	10/17/2000	10/24/2000	rmp	
589880 C-10-4 25-31" Project #98022						
Lead	38	mg/kg	10/17/2000	10/31/2000	llw	SW 7420
ICP Metals Prep (Solid)	1.008	g	10/17/2000	10/24/2000	rmp	
589881 C-10-5 33-38" (Floor) #98022						
Lead	160	mg/kg	10/17/2000	10/31/2000	llw	SW 7420
ICP Metals Prep (Solid)	1.011	g	10/17/2000	10/24/2000	rmp	

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ANALYTICAL REPORT

Carol Wilson
CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

11/06/2000

Date Received: 10/19/2000
Job Number: 00.13417

	Result	Units	Date Taken	Date Analyzed	Analyst	Analysis Method
589845 B-2-7 Composite Project #98022						
Solid pH Measured in Water	8.0	units	10/17/2000	10/20/2000	sas	SW 9045
Solids, Total	93.35	%	10/17/2000	10/19/2000	sas	SM 2540 G
TCLP - Mercury	<0.0020	mg/L	10/17/2000	10/31/2000	heh	SW 7470
ICP TCLP METALS			10/17/2000			
TCLP Arsenic (ICP)	<0.150	mg/L	10/17/2000	11/03/2000	llw	SW 6010B
TCLP Barium (ICP)	0.489	mg/L	10/17/2000	11/03/2000	llw	SW 6010B
TCLP Cadmium (ICP)	<0.020	mg/L	10/17/2000	11/03/2000	llw	SW 6010B
TCLP Chromium (ICP)	<0.020	mg/L	10/17/2000	11/03/2000	llw	SW 6010B
TCLP Lead (ICP)	4.3	mg/L	10/17/2000	11/03/2000	llw	SW 6010B
TCLP Selenium (ICP)	<0.15	mg/L	10/17/2000	11/03/2000	llw	SW 6010B
TCLP Silver (ICP)	<0.020	mg/L	10/17/2000	11/03/2000	llw	SW 6010B
589846 B-3-7 Composite Project #98022						
Solid pH Measured in Water	7.5	units	10/17/2000	10/20/2000	sas	SW 9045
Solids, Total	92.73	%	10/17/2000	10/19/2000	sas	SM 2540 G
TCLP - Mercury	<0.0020	mg/L	10/17/2000	10/31/2000	heh	SW 7470
ICP TCLP METALS			10/17/2000			
TCLP Arsenic (ICP)	<0.150	mg/L	10/17/2000	11/03/2000	llw	SW 6010B
TCLP Barium (ICP)	0.495	mg/L	10/17/2000	11/03/2000	llw	SW 6010B
TCLP Cadmium (ICP)	<0.020	mg/L	10/17/2000	11/03/2000	llw	SW 6010B
TCLP Chromium (ICP)	<0.020	mg/L	10/17/2000	11/03/2000	llw	SW 6010B
TCLP Lead (ICP)	1.3	mg/L	10/17/2000	11/03/2000	llw	SW 6010B

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ANALYTICAL REPORT

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CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

11/06/2000

Date Received: 10/19/2000
Job Number: 00.13417

	Result	Units	Date Taken	Date Analyzed	Analyst	Analysis Method
589846 B-3-7 Composite Project #98022						
TCLP Selenium (ICP)	<0.15	mg/L	10/17/2000	11/03/2000	llw	SW 6010B
TCLP Silver (ICP)	<0.020	mg/L	10/17/2000	11/03/2000	llw	SW 6010B
589847 B-4-6 Composite Project #98022						
Solid pH Measured in Water	7.6	units	10/17/2000	10/20/2000	sas	SW 9045
Solids, Total	90.84	%	10/17/2000	10/19/2000	sas	SM 2540 G
TCLP - Mercury	<0.0020	mg/L	10/17/2000	10/31/2000	heh	SW 7470
ICP TCLP METALS			10/17/2000			
TCLP Arsenic (ICP)	<0.150	mg/L	10/17/2000	11/03/2000	llw	SW 6010B
TCLP Barium (ICP)	0.518	mg/L	10/17/2000	11/03/2000	llw	SW 6010B
TCLP Cadmium (ICP)	<0.020	mg/L	10/17/2000	11/03/2000	llw	SW 6010B
TCLP Chromium (ICP)	<0.020	mg/L	10/17/2000	11/03/2000	llw	SW 6010B
TCLP Lead (ICP)	2.0	mg/L	10/17/2000	11/03/2000	llw	SW 6010B
TCLP Selenium (ICP)	<0.15	mg/L	10/17/2000	11/03/2000	llw	SW 6010B
TCLP Silver (ICP)	<0.020	mg/L	10/17/2000	11/03/2000	llw	SW 6010B
589848 B-5-6 Composite Project #98022						
Solid pH Measured in Water	7.7	units	10/17/2000	10/20/2000	sas	SW 9045
Solids, Total	92.77	%	10/17/2000	10/19/2000	sas	SM 2540 G
TCLP - Mercury	<0.0020	mg/L	10/17/2000	10/31/2000	heh	SW 7470
ICP TCLP METALS			10/17/2000			

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Anamosa, IA 52205

11/06/2000

Date Received: 10/19/2000
Job Number: 00.13417

	Result	Units	Date Taken	Date Analyzed	Analyst	Analysis Method
589848 B-5-6 Composite Project #98022						
TCLP Arsenic (ICP)	<0.150	mg/L	10/17/2000	11/03/2000	llw	SW 6010B
TCLP Barium (ICP)	0.487	mg/L	10/17/2000	11/03/2000	llw	SW 6010B
TCLP Cadmium (ICP)	<0.020	mg/L	10/17/2000	11/03/2000	llw	SW 6010B
TCLP Chromium (ICP)	<0.020	mg/L	10/17/2000	11/03/2000	llw	SW 6010B
TCLP Lead (ICP)	1.4	mg/L	10/17/2000	11/03/2000	llw	SW 6010B
TCLP Selenium (ICP)	<0.15	mg/L	10/17/2000	11/03/2000	llw	SW 6010B
TCLP Silver (ICP)	<0.020	mg/L	10/17/2000	11/03/2000	llw	SW 6010B
589849 S-10-3 Composite Project #98022						
Solid pH Measured in Water	8.0	units	10/17/2000	10/20/2000	sas	SW 9045
Solids, Total	92.96	%	10/17/2000	10/19/2000	sas	SM 2540 G
TCLP - Mercury	<0.0020	mg/L	10/17/2000	10/31/2000	heh	SW 7470
ICP TCLP METALS			10/17/2000			
TCLP Arsenic (ICP)	<0.150	mg/L	10/17/2000	11/03/2000	llw	SW 6010B
TCLP Barium (ICP)	1.4	mg/L	10/17/2000	11/03/2000	llw	SW 6010B
TCLP Cadmium (ICP)	<0.020	mg/L	10/17/2000	11/03/2000	llw	SW 6010B
TCLP Chromium (ICP)	<0.020	mg/L	10/17/2000	11/03/2000	llw	SW 6010B
TCLP Lead (ICP)	4.4	mg/L	10/17/2000	11/03/2000	llw	SW 6010B
TCLP Selenium (ICP)	<0.15	mg/L	10/17/2000	11/03/2000	llw	SW 6010B
TCLP Silver (ICP)	<0.020	mg/L	10/17/2000	11/03/2000	llw	SW 6010B

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Anamosa, IA 52205

11/06/2000

Date Received: 10/19/2000
Job Number: 00.13417

	Result	Units	Date Taken	Date Analyzed	Analyst	Analysis Method
589850 C-7-4 Project #98022						
Solid pH Measured in Water	6.8	units	05/03/2000	10/20/2000	sas	SW 9045
Solids, Total	89.29	%	05/03/2000	10/19/2000	sas	SM 2540 G
ICP TCLP METALS			05/03/2000			
TCLP Lead (ICP)	<0.10	mg/L	05/03/2000	11/03/2000	llw	SW 6010B
589851 C-11-3 Project #98022						
Solid pH Measured in Water	8.0	units	05/03/2000	10/20/2000	sas	SW 9045
Solids, Total	91.34	%	05/03/2000	10/19/2000	sas	SM 2540 G
ICP TCLP METALS			05/03/2000			
TCLP Lead (ICP)	5.5	mg/L	05/03/2000	11/03/2000	llw	SW 6010B

Kristin Clay

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TestAmerica
INCORPORATED

QUALITY CONTROL REPORT

CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

11/01/2000

Job Number: 00.13418

Carol Wilson

Enclosed is the Quality Control data for the following samples submitted to TestAmerica, Inc. - Cedar Falls for analysis:

Sample Number	Sample Description	Date Taken	Date Received
589852	B-2-1 13-19" Project #98022	10/17/2000	10/19/2000
589853	B-2-2 10-15" Project #98022	10/17/2000	10/19/2000
589854	B-2-3 13-18" Project #98022	10/17/2000	10/19/2000
589855	B-2-3D 13-18" Project #98022	10/17/2000	10/19/2000
589856	B-2-4 14-19" Project #98022	10/17/2000	10/19/2000
589857	B-2-5 18-20" Project #98022	10/17/2000	10/19/2000
589858	B-2-6 18-20" (Floor) #98022	10/17/2000	10/19/2000
589859	B-3-1 15-21" Project #98022	10/17/2000	10/19/2000
589860	B-3-2 13-19" Project #98022	10/17/2000	10/19/2000
589861	B-3-3 9-13" Project #98022	10/17/2000	10/19/2000
589862	B-3-4 14-20" Project #98022	10/17/2000	10/19/2000
589863	B-3-5 18-22" (Floor) #98022	10/17/2000	10/19/2000
589864	B-3-6 14-20" (Floor) #98022	10/17/2000	10/19/2000
589865	B-3-6D 14-20" (Floor) #98022	10/17/2000	10/19/2000
589866	B-4-1 18-24" Project #98022	10/17/2000	10/19/2000
589867	B-4-2 16-23" Project #98022	10/17/2000	10/19/2000
589868	B-4-3 19-26" Project #98022	10/17/2000	10/19/2000
589869	B-4-4 20-25" Project #98022	10/17/2000	10/19/2000
589870	B-4-5 22-27" (Floor) #98022	10/17/2000	10/19/2000
589871	B-5-1 16-23" Project #98022	10/17/2000	10/19/2000

This Quality Control report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

TestAmerica
INCORPORATED

QUALITY CONTROL REPORT

CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

11/01/2000

Job Number: 00.13418

Carol Wilson

Enclosed is the Quality Control data for the following samples submitted to TestAmerica, Inc. - Cedar Falls for analysis:

Sample Number	Sample Description	Date Taken	Date Received
589872	B-5-2 19-25" Project #98022	10/17/2000	10/19/2000
589873	B-5-3 13-18" Project #98022	10/17/2000	10/19/2000
589874	B-5-4 14-20" Project #98022	10/17/2000	10/19/2000
589875	B-5-5 18-25" (Floor) #98022	10/17/2000	10/19/2000
589876	C-10-1 24-36" Project #98022	10/17/2000	10/19/2000
589877	C-10-1D 24-36" Project #98022	10/17/2000	10/19/2000
589878	C-10-2 29-35" Project #98022	10/17/2000	10/19/2000
589879	C-10-3 22-30" Project #98022	10/17/2000	10/19/2000
589880	C-10-4 25-31" Project #98022	10/17/2000	10/19/2000
589881	C-10-5 33-38" (Floor) #98022	10/17/2000	10/19/2000

This Quality Control report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

TestAmerica
INCORPORATED

QUALITY CONTROL REPORT

CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

11/01/2000

Carol Wilson

Job Number: 00.13418

			Date Analyzed	Prep Batch Number	Run Batch Number	Analysis Method	Reporting Limit
589852 B-2-1 13-19" Project #98022							10/17/2000
ICP Metals Prep (Solid)	1.011	g	10/23/2000	926			
ICP Metals-Solid	Complete	mg/kg	10/24/2000		1117	SW 6010B	
Lead, ICP	170	mg/kg	10/24/2000	926	1150	SW 6010B	5.0
589853 B-2-2 10-15" Project #98022							10/17/2000
ICP Metals Prep (Solid)	1.004	g	10/23/2000	926			
ICP Metals-Solid	Complete	mg/kg	10/24/2000		1117	SW 6010B	
Lead, ICP	61	mg/kg	10/24/2000	926	1150	SW 6010B	5.0
589854 B-2-3 13-18" Project #98022							10/17/2000
ICP Metals Prep (Solid)	1.023	g	10/23/2000	926			
ICP Metals-Solid	Complete	mg/kg	10/24/2000		1117	SW 6010B	
Lead, ICP	220	mg/kg	10/24/2000	926	1150	SW 6010B	5.0
589855 B-2-3D 13-18" Project #98022							10/17/2000
ICP Metals Prep (Solid)	1.012	g	10/23/2000	926			
ICP Metals-Solid	Complete	mg/kg	10/24/2000		1117	SW 6010B	
Lead, ICP	420	mg/kg	10/24/2000	926	1150	SW 6010B	5.0
589856 B-2-4 14-19" Project #98022							10/17/2000
ICP Metals Prep (Solid)	1.030	g	10/23/2000	926			
ICP Metals-Solid	Complete	mg/kg	10/24/2000		1117	SW 6010B	
Lead, ICP	540	mg/kg	10/24/2000	926	1150	SW 6010B	5.0

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QUALITY CONTROL REPORT

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P.O. Box 367
Anamosa, IA 52205

11/01/2000

Carol Wilson

Job Number: 00.13418

			Date Analyzed	Prep Batch Number	Run Batch Number	Analysis Method	Reporting Limit
589857 B-2-5 18-20" Project #98022							10/17/2000
ICP Metals Prep (Solid)	1.007	g	10/23/2000	926			
ICP Metals-Solid	Complete	mg/kg	10/24/2000		1117	SW 6010B	
Lead, ICP	220	mg/kg	10/24/2000	926	1150	SW 6010B	5.0
589858 B-2-6 18-20" (Floor) #98022							10/17/2000
ICP Metals Prep (Solid)	1.029	g	10/23/2000	926			
ICP Metals-Solid	Complete	mg/kg	10/24/2000		1117	SW 6010B	
Lead, ICP	51	mg/kg	10/24/2000	926	1150	SW 6010B	5.0
589859 B-3-1 15-21" Project #98022							10/17/2000
ICP Metals Prep (Solid)	1.001	g	10/23/2000	926			
ICP Metals-Solid	Complete	mg/kg	10/24/2000		1117	SW 6010B	
Lead, ICP	12	mg/kg	10/24/2000	926	1150	SW 6010B	5.0
589860 B-3-2 13-19" Project #98022							10/17/2000
ICP Metals Prep (Solid)	1.008	g	10/23/2000	926			
ICP Metals-Solid	Complete	mg/kg	10/24/2000		1117	SW 6010B	
Lead, ICP	15	mg/kg	10/24/2000	926	1150	SW 6010B	5.0
589861 B-3-3 9-13" Project #98022							10/17/2000
ICP Metals Prep (Solid)	1.008	g	10/23/2000	926			
ICP Metals-Solid	Complete	mg/kg	10/24/2000		1117	SW 6010B	
Lead, ICP	390	mg/kg	10/24/2000	926	1150	SW 6010B	5.0

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11/01/2000

Carol Wilson

Job Number: 00.13418

				Date Analyzed	Prep Batch Number	Run Batch Number	Analysis Method	Reporting Limit
589862 B-3-4 14-20" Project #98022							10/17/2000	
Lead	56	mg/kg		10/31/2000		353	SW 7420	5.0
ICP Metals Prep (Solid)	1.021	g		10/24/2000	927			
589863 B-3-5 18-22" (Floor) #98022							10/17/2000	
Lead	<5.0	mg/kg		10/31/2000		353	SW 7420	5.0
ICP Metals Prep (Solid)	1.000	g		10/24/2000	927			
589864 B-3-6 14-20" (Floor) #98022							10/17/2000	
Lead	6.2	mg/kg		10/31/2000		353	SW 7420	5.0
ICP Metals Prep (Solid)	1.014	g		10/24/2000	927			
589865 B-3-6D 14-20" (Floor) #98022							10/17/2000	
Lead	<5.0	mg/kg		10/31/2000		353	SW 7420	5.0
ICP Metals Prep (Solid)	1.011	g		10/24/2000	927			
589866 B-4-1 18-24" Project #98022							10/17/2000	
Lead	5.9	mg/kg		10/31/2000		353	SW 7420	5.0
ICP Metals Prep (Solid)	1.001	g		10/24/2000	927			
589867 B-4-2 16-23" Project #98022							10/17/2000	
Lead	11	mg/kg		10/31/2000		353	SW 7420	5.0
ICP Metals Prep (Solid)	1.015	g		10/24/2000	927			

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QUALITY CONTROL REPORT

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11/01/2000

Carol Wilson

Job Number: 00.13418

				Date Analyzed	Prep Batch Number	Run Batch Number	Analysis Method	Reporting Limit
589868	B-4-3	19-26"	Project #98022				10/17/2000	
Lead		45	mg/kg	10/31/2000		353	SW 7420	5.0
ICP Metals Prep (Solid)		1.015	g	10/24/2000	927			
589869	B-4-4	20-25"	Project #98022				10/17/2000	
Lead		20	mg/kg	10/31/2000		353	SW 7420	5.0
ICP Metals Prep (Solid)		1.006	g	10/24/2000	927			
589870	B-4-5	22-27"	(Floor) #98022				10/17/2000	
Lead		<5.0	mg/kg	10/31/2000		353	SW 7420	5.0
ICP Metals Prep (Solid)		1.019	g	10/24/2000	927			
589871	B-5-1	16-23"	Project #98022				10/17/2000	
Lead		5.5	mg/kg	10/31/2000		353	SW 7420	5.0
ICP Metals Prep (Solid)		1.013	g	10/24/2000	927			
589872	B-5-2	19-25"	Project #98022				10/17/2000	
Lead		<5.0	mg/kg	10/31/2000		353	SW 7420	5.0
ICP Metals Prep (Solid)		1.027	g	10/24/2000	927			
589873	B-5-3	13-18"	Project #98022				10/17/2000	
Lead		6.4	mg/kg	10/31/2000		353	SW 7420	5.0
ICP Metals Prep (Solid)		1.005	g	10/24/2000	927			

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QUALITY CONTROL REPORT

CHEM-ECO ENGINEERS, INC.
P.O. Box 367
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11/01/2000

Carol Wilson

Job Number: 00.13418

			Date Analyzed	Prep Batch Number	Run Batch Number	Analysis Method	Reporting Limit
589874	B-5-4 14-20" Project #98022					10/17/2000	
Lead	7.6	mg/kg	10/31/2000		353	SW 7420	5.0
ICP Metals Prep (Solid)	1.015	g	10/24/2000	927			
589875	B-5-5 18-25" (Floor) #98022					10/17/2000	
Lead	<5.0	mg/kg	10/31/2000		353	SW 7420	5.0
ICP Metals Prep (Solid)	1.001	g	10/24/2000	927			
589876	C-10-1 24-36" Project #98022					10/17/2000	
Lead	19	mg/kg	10/31/2000		353	SW 7420	5.0
ICP Metals Prep (Solid)	1.003	g	10/24/2000	927			
589877	C-10-1D 24-36" Project #98022					10/17/2000	
Lead	16	mg/kg	10/31/2000		353	SW 7420	5.0
ICP Metals Prep (Solid)	1.023	g	10/24/2000	927			
589878	C-10-2 29-35" Project #98022					10/17/2000	
Lead	190	mg/kg	10/31/2000		353	SW 7420	5.0
ICP Metals Prep (Solid)	1.008	g	10/24/2000	927			
589879	C-10-3 22-30" Project #98022					10/17/2000	
Lead	91	mg/kg	10/31/2000		353	SW 7420	5.0
ICP Metals Prep (Solid)	1.041	g	10/24/2000	927			

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QUALITY CONTROL REPORT

CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

11/01/2000

Carol Wilson

Job Number: 00.13418

			Date Analyzed	Prep Batch Number	Run Batch Number	Analysis Method	Reporting Limit
589880	C-10-4 25-31" Project #98022					10/17/2000	
Lead	38	mg/kg	10/31/2000		353	SW 7420	5.0
ICP Metals Prep (Solid)	1.008	g	10/24/2000	927			
589881	C-10-5 33-38" (Floor) #98022					10/17/2000	
Lead	160	mg/kg	10/31/2000		353	SW 7420	5.0
ICP Metals Prep (Solid)	1.011	g	10/24/2000	927			

TestAmerica INCORPORATED

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613

Phone: 319-277-2401
Fax: 319-277-2425

To assist us in using the proper analytical methods, is this work being conducted for regulatory purposes?
Compliance Monitoring RCRA Closure

Client Name: CHEM-ECO Client #:
Address: P.O. Box 367 Anamosa 52205 Project Name: 98-022
City/State/Zip Code: Project #:
Project Manager: Carol W. Ilson Site/Location ID: State:
Telephone Number: 319-484-2618 Fax: 319-484-2930 Report To: CHEM-ECO
Sampler Name: (Print Name) Carol W. Ilson Invoice To: CHEM-ECO
Sampler Signature: Carol E Wilson Quote #: PO#:

TAT: ✓ Standard; ___ Rush (surcharges may apply)
Date Needed:
Fax Results: Y N

QC Deliverables: ___ None; ✓ Level 2 (Batch QC); ___ Level 3; ___ Level 4; Other:

SAMPLE ID	Date Sampled	Time Sampled	G = Grab, C = Composite	Field Filtered	Matrix: SL - Sludge, DW - Drinking Water, GW - Groundwater, S - Soil/Solid, WW - Wastewater, Specify Other	Preservation & # of Containers: HNO_3	HCl	NaOH	H_2SO_4	Methanol	None	Other (Specify)	Analyze For: TCLP Lead only	REMARKS
C-7-4	5-3-00		G		S						✓		✓	
C-11-3	5-3-00		G		S						✓		✓	

Special Instructions: TCLP analysis for Lead only

LABORATORY COMMENTS:
Init Lab Temp:
Rec Lab Temp:
Custody Seals: Y N N/A
Bottles Supplied by TestAmerica: Y N
Method of Shipment:

Relinquished By: Carol E Wilson	Date: 10/18	Time: 4pm	Received By: Debra Muelling	Date: 10-19-00	Time: 8:00
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:

TestAmerica INCORPORATED

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613

Phone: 319-277-2401
Fax: 319-277-2425

To assist us in using the proper analytical methods, is this work being conducted for regulatory purposes?
Compliance Monitoring RCRA Closure

Client Name: [redacted] CHEM-FCO Client #:
Address: P.O. Box 367 Anamosa IA 52205 Project Name:
City/State/Zip Code: [redacted] Project #: 98-022
Project Manager: Carol Wilson Site/Location ID: State:
Telephone Number: 319-484-2618 Fax: 319-484-2930 Report To: Carol Wilson
Sampler Name: (Print Name) Carol Wilson Invoice To: CHEM-FCO
Sampler Signature: Carol E Wilson Quote #: PO#:

TAT: ✓ Standard; ___ Rush (surcharges may apply)
Date Needed:
Fax Results: Y N

QC Deliverables: ___ None; ✓ Level 2 (Batch QC); ___ Level 3; ___ Level 4; Other:

SAMPLE ID	Date Sampled	Time Sampled	G = Grab, C = Composite	Field Filtered	Matrix: SL - Sludge DW - Drinking Water GW - Groundwater S - Soil/Solid WW - Wastewater Specify Other	Preservation & # of Containers: HNO_3	HCl	NaOH	H_2SO_4	Methanol	None	Other (Specify)	Analyze For: Total Lead	REMARKS
B-2-1 13-14"	10-17-00	11:15a	G		S						✓		✓	
B-2-2 16-15"		11:20a	G		S						✓		✓	
B-2-3 13-18"		11:25a	G		S						✓		✓	
B-2-3D 13-18"		11:25a	G		S						✓		✓	
B-2-4 14-19"		11:30a	G		S						✓		✓	
B-2-5 18-20"		11:30a	G		S						✓		✓	
B-2-6 18-20" floor		11:30a	G		S						✓		✓	
B-3-1 15-21"		11:35a	G		S						✓		✓	
B-3-2 13-19"		11:38a	G		S						✓		✓	
B-3-3 9-13"	↓	11:40	G		S						✓		✓	

Special Instructions:

LABORATORY COMMENTS:
Init Lab Temp:
Rec Lab Temp:
Custody Seals: Y N N/A
Bottles Supplied by TestAmerica: Y N
Method of Shipment:

	Date	Time		Date	Time
Relinquished By: Carol E Wilson	10/18	4p	Received By: Debra Muelling	10-19-00	8:00
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:

TestAmerica INCORPORATED

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613

Phone: 319-277-2401
Fax: 319-277-2425

To assist us in using the proper analytical methods, is this work being conducted for regulatory purposes?
Compliance Monitoring KCRA Closure

Client Name: CHEM-ECO Client #:
Address: P.O. Box 367
City/State/Zip Code: Anamosa IA 52205
Project Manager: Carol Wilson
Telephone Number: 319 464 2618 Fax: 319 464 2920
Sampler Name: (Print Name) Carol Wilson
Sampler Signature: Carol E Wilson

Project Name: 98-022
Project #:
Site/Location ID: State:
Report To: CHEM-ECO
Invoice To: CHEM-ECO
Quote #: PO#:

TAT: ✓ Standard; ___ Rush (surcharges may apply)
Date Needed:
Fax Results: Y N

QC Deliverables: None; ✓ Level 2 (Batch QC); ___ Level 3; ___ Level 4; Other:

SAMPLE ID	Date Sampled	Time Sampled	G = Grab, C = Composite	Field Filtered	Matrix: SL - Sludge, DW - Drinking Water, GW - Groundwater, S - Soil/Solid, WW - Wastewater, Specify Other	Preservation & # of Containers: HNO_3	HCl	NaOH	H_2SO_4	Methanol	None	Other (Specify)	Analyze For: Total Lead	REMARKS
B-3-4 14-20"	10.17.00	11:45a	G		S						✓			
B-3-5 18-22" floor		11:50a	G		S						✓			
B-3-6 14-20" floor		11:53a	G		S						✓			
B-3-6D 14-20" floor		11:55a	G		S						✓			
B-4-1 18-24"		Dup	G		S						✓			
B-4-2 16-23"		1203p	G		S						✓			
B-4-3 19-26"		1205p	G		S						✓			
B-4-4 20-25"		1210p	G		S						✓			
B-4-5 22-27" floor		1215p	G		S						✓			
B-5-1 16-23"	↓	1220p	G		S						✓			

Special Instructions:

LABORATORY COMMENTS:
Init Lab Temp:
Rec Lab Temp:
Custody Seals: Y N N/A
Bottles Supplied by TestAmerica: Y N
Method of Shipment:

	Date	Time		Date	Time
Relinquished By: Carol E Wilson	10/18	4 pm	Received By: Debra Wuebbing	10-19-00	8:00
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:

TestAmerica INCORPORATED

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613

Phone: 319-277-2401
Fax: 319-277-2425

To assist us in using the proper analytical methods, is this work being conducted for regulatory purposes?
Compliance Monitoring RCRA Closure

Client Name: CHEM-ECO Client #:
Address: P.O. Box 367 Anamosa IA 52205 Project Name: 98-G22
City/State/Zip Code: Project #:
Project Manager: Carol Wilson Site/Location ID: State:
Telephone Number: 319 484 2618 Fax: 319 464 2930 Report To: CHEM-ECO
Sampler Name: (Print Name) Carol Wilson Invoice To: CHEM-ECO
Sampler Signature: Carol E Wilson Quote #: PO#:

TAT: ✓ Standard; ___ Rush (surcharges may apply)
Date Needed:
Fax Results: Y N

QC Deliverables: ___ None; ✓ Level 2 (Batch QC); ___ Level 3; ___ Level 4; Other:

SAMPLE ID	Date Sampled	Time Sampled	G = Grab, C = Composite	Field Filtered	Matrix: SL - Sludge DW - Drinking Water GW - Groundwater S - Soil/Solid WW - Wastewater Specify Other	Preservation & # of Containers: HNO_3	HCl	NaOH	H_2SO_4	Methanol	None	Other (Specify)	Analyze For: Total Lead	REMARKS
B-5-2 19-25"	10-17-00	1225p	G		S						✓		✓	
B-5-3 13-18"		1231p	G		S						✓		✓	
B-5-4 14-20"		1235p	G		S						✓		✓	
B-5-5 18-25" floor		1240p	G		S						✓		✓	
C-10-1 24-36"		9 am	G		S						✓		✓	
C-10-1D 24-36"		900am	G		S						✓		✓	
C-10-2 [redacted]29-35"		910am	G		S						✓		✓	
C-10-3 22-30"		915am	G		S						✓		✓	
C-10-4 25-31"		920am	G		S						✓		✓	
C-10-5 33-39" floor		905am	G		S						✓		✓	

Special Instructions:

LABORATORY COMMENTS:
Init Lab Temp:
Rec Lab Temp:
Custody Seals: Y N N/A
Bottles Supplied by TestAmerica: Y N
Method of Shipment:

	Date	Time		Date	Time
Relinquished By: Carol E Wilson	10/18	4p	Received By: Edna Muehling	10-19-00	8:00
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:

TestAmerica
INCORPORATED

QUALITY CONTROL REPORT

CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

11/06/2000

Job Number: 00.13417

Carol Wilson

Enclosed is the Quality Control data for the following samples submitted to TestAmerica, Inc. - Cedar Falls for analysis:

Sample Number	Sample Description	Date Taken	Date Received
589845	B-2-7 Composite Project #98022	10/17/2000	10/19/2000
589846	B-3-7 Composite Project #98022	10/17/2000	10/19/2000
589847	B-4-6 Composite Project #98022	10/17/2000	10/19/2000
589848	B-5-6 Composite Project #98022	10/17/2000	10/19/2000
589849	S-10-3 Composite Project #98022	10/17/2000	10/19/2000
589850	C-7-4 Project #98022	05/03/2000	10/19/2000
589851	C-11-3 Project #98022	05/03/2000	10/19/2000

This Quality Control report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

TestAmerica
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QUALITY CONTROL REPORT

CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

11/06/2000

Carol Wilson

Job Number: 00.13417

			Date Analyzed	Prep Batch Number	Run Batch Number	Analysis Method	Reporting Limit
589845 B-2-7 Composite Project #98022							10/17/2000
Solid pH Measured in Water	8.0	units	10/20/2000		1111	SW 9045	0.1
Solids, Total	93.35	%	10/19/2000		1734	SM 2540 G	0.01
TCLP - Mercury	<0.0020	mg/L	10/31/2000		768	SW 7470	0.0020
ICP TCLP METALS							
TCLP Arsenic (ICP)	<0.150	mg/L	11/03/2000	1460	1273	SW 6010B	0.150
TCLP Barium (ICP)	0.489	mg/L	11/03/2000	1460	1271	SW 6010B	0.100
TCLP Cadmium (ICP)	<0.020	mg/L	11/03/2000	1460	1274	SW 6010B	0.020
TCLP Chromium (ICP)	<0.020	mg/L	11/03/2000	1460	1271	SW 6010B	0.020
TCLP Lead (ICP)	4.3	mg/L	11/03/2000	1460	1274	SW 6010B	0.10
TCLP Selenium (ICP)	<0.15	mg/L	11/03/2000	1460	1273	SW 6010B	0.15
TCLP Silver (ICP)	<0.020	mg/L	11/03/2000	1460	1270	SW 6010B	0.020
589846 B-3-7 Composite Project #98022							10/17/2000
Solid pH Measured in Water	7.5	units	10/20/2000		1111	SW 9045	0.1
Solids, Total	92.73	%	10/19/2000		1734	SM 2540 G	0.01
TCLP - Mercury	<0.0020	mg/L	10/31/2000		768	SW 7470	0.0020
ICP TCLP METALS							
TCLP Arsenic (ICP)	<0.150	mg/L	11/03/2000	1460	1273	SW 6010B	0.150
TCLP Barium (ICP)	0.495	mg/L	11/03/2000	1460	1271	SW 6010B	0.100
TCLP Cadmium (ICP)	<0.020	mg/L	11/03/2000	1460	1274	SW 6010B	0.020
TCLP Chromium (ICP)	<0.020	mg/L	11/03/2000	1460	1271	SW 6010B	0.020
TCLP Lead (ICP)	1.3	mg/L	11/03/2000	1460	1274	SW 6010B	0.10
TCLP Selenium (ICP)	<0.15	mg/L	11/03/2000	1460	1273	SW 6010B	0.15
TCLP Silver (ICP)	<0.020	mg/L	11/03/2000	1460	1270	SW 6010B	0.020
589847 B-4-6 Composite Project #98022							10/17/2000
Solid pH Measured in Water	7.6	units	10/20/2000		1111	SW 9045	0.1
Solids, Total	90.84	%	10/19/2000		1734	SM 2540 G	0.01

TestAmerica
INCORPORATED

QUALITY CONTROL REPORT

CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

11/06/2000

Carol Wilson

Job Number: 00.13417

			Date Analyzed	Prep Batch Number	Run Batch Number	Analysis Method	Reporting Limit
589847 B-4-6 Composite Project #98022							10/17/2000
TCLP - Mercury	<0.0020	mg/L	10/31/2000		768	SW 7470	0.0020
ICP TCLP METALS							
TCLP Arsenic (ICP)	<0.150	mg/L	11/03/2000	1460	1273	SW 6010B	0.150
TCLP Barium (ICP)	0.518	mg/L	11/03/2000	1460	1271	SW 6010B	0.100
TCLP Cadmium (ICP)	<0.020	mg/L	11/03/2000	1460	1274	SW 6010B	0.020
TCLP Chromium (ICP)	<0.020	mg/L	11/03/2000	1460	1271	SW 6010B	0.020
TCLP Lead (ICP)	2.0	mg/L	11/03/2000	1460	1274	SW 6010B	0.10
TCLP Selenium (ICP)	<0.15	mg/L	11/03/2000	1460	1273	SW 6010B	0.15
TCLP Silver (ICP)	<0.020	mg/L	11/03/2000	1460	1270	SW 6010B	0.020
589848 B-5-6 Composite Project #98022							10/17/2000
Solid pH Measured in Water	7.7	units	10/20/2000		1111	SW 9045	0.1
Solids, Total	92.77	%	10/19/2000		1734	SM 2540 G	0.01
TCLP - Mercury	<0.0020	mg/L	10/31/2000		768	SW 7470	0.0020
ICP TCLP METALS							
TCLP Arsenic (ICP)	<0.150	mg/L	11/03/2000	1460	1273	SW 6010B	0.150
TCLP Barium (ICP)	0.487	mg/L	11/03/2000	1460	1271	SW 6010B	0.100
TCLP Cadmium (ICP)	<0.020	mg/L	11/03/2000	1460	1274	SW 6010B	0.020
TCLP Chromium (ICP)	<0.020	mg/L	11/03/2000	1460	1271	SW 6010B	0.020
TCLP Lead (ICP)	1.4	mg/L	11/03/2000	1460	1274	SW 6010B	0.10
TCLP Selenium (ICP)	<0.15	mg/L	11/03/2000	1460	1273	SW 6010B	0.15
TCLP Silver (ICP)	<0.020	mg/L	11/03/2000	1460	1270	SW 6010B	0.020
589849 S-10-3 Composite Project #98022							10/17/2000
Solid pH Measured in Water	8.0	units	10/20/2000		1111	SW 9045	0.1
Solids, Total	92.96	%	10/19/2000		1734	SM 2540 G	0.01
TCLP - Mercury	<0.0020	mg/L	10/31/2000		768	SW 7470	0.0020
ICP TCLP METALS							

TestAmerica
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QUALITY CONTROL REPORT

CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

11/06/2000

Carol Wilson

Job Number: 00.13417

			Date Analyzed	Prep Batch Number	Run Batch Number	Analysis Method	Reporting Limit
589849 S-10-3 Composite Project #98022							10/17/2000
TCLP Arsenic (ICP)	<0.150	mg/L	11/03/2000	1460	1273	SW 6010B	0.150
TCLP Barium (ICP)	1.4	mg/L	11/03/2000	1460	1271	SW 6010B	0.100
TCLP Cadmium (ICP)	<0.020	mg/L	11/03/2000	1460	1274	SW 6010B	0.020
TCLP Chromium (ICP)	<0.020	mg/L	11/03/2000	1460	1271	SW 6010B	0.020
TCLP Lead (ICP)	4.4	mg/L	11/03/2000	1460	1274	SW 6010B	0.10
TCLP Selenium (ICP)	<0.15	mg/L	11/03/2000	1460	1273	SW 6010B	0.15
TCLP Silver (ICP)	<0.020	mg/L	11/03/2000	1460	1270	SW 6010B	0.020
589850 C-7-4 Project #98022							05/03/2000
Solid pH Measured in Water	6.8	units	10/20/2000		1112	SW 9045	0.1
Solids, Total	89.29	%	10/19/2000		1734	SM 2540 G	0.01
ICP TCLP METALS							
TCLP Lead (ICP)	<0.10	mg/L	11/03/2000	1460	1274	SW 6010B	0.10
589851 C-11-3 Project #98022							05/03/2000
Solid pH Measured in Water	8.0	units	10/20/2000		1112	SW 9045	0.1
Solids, Total	91.34	%	10/19/2000		1734	SM 2540 G	0.01
ICP TCLP METALS							
TCLP Lead (ICP)	5.5	mg/L	11/03/2000	1460	1274	SW 6010B	0.10

TestAmerica
INCORPORATED

QUALITY CONTROL REPORT
BLANKS

CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

11/06/2000

Carol Wilson

Job Number: 00.13417

Analyte	Prep Batch Number	Run Batch Number	Blank Analysis	Units	Date Analyzed	Analyst
TCLP - Mercury		768	<0.0020	mg/L	10/31/2000	heh
TCLP Arsenic (ICP)	1460	1273	<0.150	mg/L	11/03/2000	llw
TCLP Barium (ICP)	1460	1271	<0.100	mg/L	11/03/2000	llw
TCLP Cadmium (ICP)	1460	1274	<0.020	mg/L	11/03/2000	llw
TCLP Chromium (ICP)	1460	1271	<0.020	mg/L	11/03/2000	llw
TCLP Lead (ICP)	1460	1274	<0.10	mg/L	11/03/2000	llw
TCLP Selenium (ICP)	1460	1273	<0.15	mg/L	11/03/2000	llw
TCLP Silver (ICP)	1460	1270	<0.020	mg/L	11/03/2000	llw

NA - Not Applicable

Advisory Control Limits for Blanks:
Metals/Wet Chemistry/ Conventionals/GC - all compounds should be less than the Reporting Limit.
GC/MS - Semi-Volatiles - all compounds should be less than the Reporting Limit except for phthalates which should be less than 5 times the reporting limit.
Volatiles - Toluene, methylene chloride, acetone and chloroform should be less than 5 times the Reporting Limit. All other volatile compounds should be less than the Reporting Limit.

TestAmerica
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QUALITY CONTROL REPORT
STANDARDS

CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

11/06/2000

Carol Wilson

Job Number: 00.13417

Analyte	Prep Batch Number	Run Batch Number	CCV % Recovery	LCS % Recovery	Analyst
Solid pH Measured in Water		1111	100.0		
Solid pH Measured in Water		1111	100.5		
Solid pH Measured in Water		1112	100.5		
Solid pH Measured in Water		1112	100.8		
TCLP - Mercury		768	97.0	95.2	heh
ICP TCLP METALS					
TCLP Arsenic (ICP)	1460	1273	101.8	102.0	llw
TCLP Arsenic (ICP)		1273	100.2		
TCLP Barium (ICP)	1460	1271	101.8	97.6	llw
TCLP Barium (ICP)		1271	100.6		
TCLP Cadmium (ICP)	1460	1274	105.2	100.0	llw
TCLP Cadmium (ICP)		1274	102.0		
TCLP Chromium (ICP)	1460	1271	102.4	95.9	llw
TCLP Chromium (ICP)		1271	100.8		
TCLP Lead (ICP)	1460	1274	101.8	97.5	llw
TCLP Lead (ICP)		1274	99.8		
TCLP Selenium (ICP)	1460	1273	101.8	107.5	llw
TCLP Selenium (ICP)		1273	100.6		
TCLP Silver (ICP)	1460	1270	96.6	92.0	llw
TCLP Silver (ICP)		1270	95.1		

CCV - Continuing Calibration Verification
LCS - Laboratory Control Standard
NA - Not Applicable

TestAmerica
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QUALITY CONTROL REPORT
DUPLICATES/SPIKES

CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

11/06/2000

Carol Wilson

Job Number: 00.13417

Analyte	Prep Batch Number	Run Batch Number	Original Analysis	Duplicate Analysis	Units	RPD	Spike Result	Units	Percent Recovery
Solid pH Measured in Water		1111	8.2	8.2	units	0.0			
Solid pH Measured in Water		1112	6.8	6.8	units	0.0			
Solids, Total		1734	92.73	91.60	%	1.2			
Solids, Total		1734	11.13	11.17	%	0.4			
TCLP - Mercury							0.0026	mg/L	0.0
TCLP - Mercury							0.0156	mg/L	93.4
ICP TCLP METALS									
TCLP Arsenic (ICP)	1460						2.00	mg/L	100.0
TCLP Arsenic (ICP)	1460						2.04	mg/L	102.0
TCLP Arsenic (ICP)	1460						2.01	mg/L	100.5
TCLP Barium (ICP)	1460						1.00	mg/L	100.0
TCLP Barium (ICP)	1460						1.44	mg/L	95.1
TCLP Barium (ICP)	1460						1.11	mg/L	94.5
TCLP Cadmium (ICP)	1460						1.00	mg/L	100.0
TCLP Cadmium (ICP)	1460						1.00	mg/L	100.0
TCLP Cadmium (ICP)	1460						0.9636	mg/L	96.4
TCLP Chromium (ICP)	1460						1.00	mg/L	100.0
TCLP Chromium (ICP)	1460						0.9692	mg/L	96.9
TCLP Chromium (ICP)	1460						0.9565	mg/L	95.7
TCLP Lead (ICP)	1460						2.00	mg/L	100.0
TCLP Lead (ICP)	1460						6.25	mg/L	97.5
TCLP Lead (ICP)	1460						1.92	mg/L	96.0
TCLP Selenium (ICP)	1460						4.00	mg/L	100.0
TCLP Selenium (ICP)	1460						4.32	mg/L	108.0
TCLP Selenium (ICP)	1460						4.19	mg/L	104.8
TCLP Silver (ICP)	1460							mg/L	
TCLP Silver (ICP)	1460						0.875	mg/L	87.6
TCLP Silver (ICP)	1460							mg/L	

NOTE: Spikes and Duplicates may not be samples from this job.

NA - Not Applicable
RPD - Relative Percent Difference

Advisory Control Limits for Duplicates - RPD should be less than 20.

Advisory Control Limits for Spikes - Spike recovery should be 75 - 125%.

TestAmerica INCORPORATED

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613

Phone: 319-277-2401
Fax: 319-277-2425

To assist us in using the proper analytical methods, is this work being conducted for regulatory purposes?
Compliance Monitoring: RCRA Closure

Client Name: ~~CH~~ ~~[illegible]~~ CHEM-ECO   Client #:
Address: P.O. Box 367 Anamosa IA 52205
City/State/Zip Code: ~~[illegible] IA~~
Project Manager: Carol Wilson
Telephone Number: 319-484-2618   Fax: 319-484-2930
Sampler Name: (Print Name) Carol Wilson
Sampler Signature: Carol E Wilson

Project Name:
Project #: 98-022
Site/Location ID: State:
Report To: Carol Wilson
Invoice To: CHEM-ECO P.O. Box 367 Anamosa 52205
Quote #:   PO#:

TAT: ✓ Standard
___ Rush (surcharges may apply)
Date Needed:
Fax Results: Y (N)

SAMPLE ID	Date Sampled	Time Sampled	G = Grab, C = Composite	Field Filtered	Matrix (SL - Sludge DW - Drinking Water GW - Groundwater S - Soil/Solid WW - Wastewater Specify Other)	HNO_3	HCl	NaOH	H_2SO_4	Methanol	None	Other (Specify)	Analyze For: TCLP Metals
B-2-7 composite	10-17-00	920a	C		S						✓		✓
B-3-7 composite	10-17-00	940a	C		S						✓		✓
B-4-6 composite	10-17-00	1020a	C		S						✓		✓
B-5-6 composite	10-17-00	1100a	C		S						✓		✓
S-10-3 composite	10-17-00	900a	C		S						✓		✓

QC Deliverables
___ None
✓ Level 2 (Batch QC)
___ Level 3
___ Level 4
Other:

REMARKS

Special Instructions: TCLP for 8 RCRA metals

Relinquished By	Date	Time	Received By	Date	Time
Carol E Wilson	10/18	4pm	[illegible signature]	10-19-00	8:00

LABORATORY COMMENTS:
Init Lab Temp:
Rec Lab Temp:
Custody Seals: Y N N/A
Bottles Supplied by TestAmerica: Y N
Method of Shipment:

Appendix H

Soil and Groundwater Analytical Reports
Closure Activities 21 February 2001

TestAmerica
INCORPORATED

ANALYTICAL REPORT

Carol Wilson
CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

03/07/2001

Date Received: 02/24/2001
Job Number: 01.01863

	Result	Units	Flags	Date Taken	Date Analyzed	Time Analyzed	Analyst	Analysis Method
606699 C-10-2 Project #98-022								
Solid pH Measured in Water	7.0	units		10/17/2000	02/26/2001	13:50	sas	SW 9045
Solids, Total	92.48	%		10/17/2000	02/26/2001		sas	SM 2540 G
Lead	54	mg/kg	MSOM	10/17/2000	03/05/2001		lmc	SW 7420
ICP Metals Prep (Solid)	1.029	g		10/17/2000	03/01/2001		rmp	
ICP Metals-Solid	Complete	mg/kg		10/17/2000	03/01/2001		heh	SW 6010B
Lead, ICP	50	mg/kg	MSO	10/17/2000	03/01/2001		heh	SW 6010B
ICP TCLP METALS				10/17/2000				
TCLP Lead (ICP)	0.30	mg/L		10/17/2000	03/01/2001		heh	SW 6010B
606700 B-2-3 Project #98-022								
Solid pH Measured in Water	7.4	units		10/17/2000	02/26/2001	13:50	sas	SW 9045
Solids, Total	91.59	%		10/17/2000	02/26/2001		sas	SM 2540 G
ICP TCLP METALS				10/17/2000				
TCLP Lead (ICP)	1.38	mg/L		10/17/2000	03/01/2001		heh	SW 6010B

Key to Flags:
M - Duplicate (or MS/MSD) RPD is greater than 20%
MSO - MS and/or MSD are out of control for this analyte

Kristin Clay
Kristin M. Clay
Operations Manager
Iowa Lab Certification - 7

ANALYTICAL REPORT

Carol Wilson
CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

03/07/2001

Date Received: 02/24/2001
Job Number: 01.01863

	Result	Units	Flags	Date Taken	Date Analyzed	Time Analyzed	Analyst	Analysis Method
606701 B-3-3 Project #98-022								
Solid pH Measured in Water	7.1	units		10/17/2000	02/26/2001	13:50	sas	SW 9045
Solids, Total	91.43	%		10/17/2000	02/26/2001		sas	SM 2540 G
ICP TCLP METALS				10/17/2000				
TCLP Lead (ICP)	0.18	mg/L		10/17/2000	03/01/2001		heh	SW 6010B
606702 B-4-3 Project #98-022								
Solid pH Measured in Water	6.8	units		10/17/2000	02/26/2001	13:50	sas	SW 9045
Solids, Total	89.59	%		10/17/2000	02/26/2001		sas	SM 2540 G
ICP TCLP METALS				10/17/2000				
TCLP Lead (ICP)	<0.10	mg/L		10/17/2000	03/01/2001		heh	SW 6010B
606703 TMW-1 Project #98-022								
Turbidity	472	NTU	RH	02/21/2001	02/26/2001		rmp	EPA 180.1
Arsenic, GFAA	0.0068	mg/L		02/21/2001	03/06/2001		gjv	EPA 206.2
Mercury,Cold Vapor	<0.00020	mg/L		02/21/2001	02/27/2001	10:19	lmc	EPA 245.1
Selenium, GFAA	<0.0050	mg/L		02/21/2001	03/01/2001		gjv	EPA 270.2

Key to Flags:
RH - Received at lab past the holding time for this analyte

Kristin Clay

Kristin M. Clay
Operations Manager
Iowa Lab Certification - 7

TestAmerica
INCORPORATED

ANALYTICAL REPORT

Carol Wilson
CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

03/07/2001

Date Received: 02/24/2001
Job Number: 01.01863

	Result	Units	Flags	Date Taken	Date Analyzed	Time Analyzed	Analyst	Analysis Method
606703 TMW-1 Project #98-022								
ICP Metals - SW-6010B	Complete			02/21/2001	03/01/2001		heh	SW 6010B
Barium, ICP	0.124	mg/L		02/21/2001	03/01/2001		heh	SW 6010B
Cadmium, ICP	<0.020	mg/L		02/21/2001	03/01/2001		heh	SW 6010B
Chromium, ICP	0.020	mg/L		02/21/2001	03/01/2001		heh	SW 6010B
Lead, ICP	<0.10	mg/L		02/21/2001	03/01/2001		heh	SW 6010B
Silver, ICP	<0.020	mg/L		02/21/2001	03/01/2001		heh	SW 6010B
606704 TMW-2 Project #98-022								
Turbidity	658	NTU	RH	02/21/2001	02/26/2001		rmp	EPA 180.1
Arsenic, GFAA	0.0087	mg/L		02/21/2001	03/06/2001		gjv	EPA 206.2
Mercury,Cold Vapor	<0.00020	mg/L		02/21/2001	02/27/2001	10:22	lmc	EPA 245.1
Selenium, GFAA	<0.0050	mg/L		02/21/2001	03/01/2001		gjv	EPA 270.2
ICP Metals - SW-6010B	Complete			02/21/2001	03/01/2001		heh	SW 6010B
Barium, ICP	0.146	mg/L		02/21/2001	03/01/2001		heh	SW 6010B
Cadmium, ICP	<0.020	mg/L		02/21/2001	03/01/2001		heh	SW 6010B
Chromium, ICP	0.048	mg/L		02/21/2001	03/01/2001		heh	SW 6010B
Lead, ICP	<0.10	mg/L		02/21/2001	03/01/2001		heh	SW 6010B

Key to Flags:
RH - Received at lab past the holding time for this analyte

Kristin Clay

Kristin M. Clay
Operations Manager
Iowa Lab Certification - 7

TestAmerica INCORPORATED

ANALYTICAL REPORT

Carol Wilson
CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

03/07/2001

Date Received: 02/24/2001
Job Number: 01.01863

	Result	Units	Flags	Date Taken	Date Analyzed	Time Analyzed	Analyst	Analysis Method
606704 TMW-2	Project #98-022							
Silver, ICP	<0.020	mg/L		02/21/2001	03/01/2001		heh	SW 6010B
606705 TMW-3	Project #98-022							
Turbidity	2,052	NTU	RH	02/21/2001	02/26/2001		rmp	EPA 180.1
Arsenic, GFAA	0.0079	mg/L		02/21/2001	03/06/2001		gjv	EPA 206.2
Mercury,Cold Vapor	<0.00020	mg/L		02/21/2001	02/27/2001	10:24	lmc	EPA 245.1
Selenium, GFAA	<0.0050	mg/L		02/21/2001	03/01/2001		gjv	EPA 270.2
ICP Metals - SW-6010B	Complete			02/21/2001	03/01/2001		heh	SW 6010B
Barium, ICP	0.233	mg/L		02/21/2001	03/01/2001		heh	SW 6010B
Cadmium, ICP	<0.020	mg/L		02/21/2001	03/01/2001		heh	SW 6010B
Chromium, ICP	0.056	mg/L		02/21/2001	03/01/2001		heh	SW 6010B
Lead, ICP	0.55	mg/L		02/21/2001	03/01/2001		heh	SW 6010B
Silver, ICP	<0.020	mg/L		02/21/2001	03/01/2001		heh	SW 6010B
606706 TMW-3D	Project #98-022							
Turbidity	1,830	NTU	RH	02/21/2001	02/26/2001		rmp	EPA 180.1

Key to Flags:
RH - Received at lab past the holding time for this analyte

Kristin Clay

Kristin M. Clay
Operations Manager
Iowa Lab Certification - 7

ANALYTICAL REPORT

Carol Wilson
CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

03/07/2001

Date Received: 02/24/2001
Job Number: 01.01863

	Result	Units	Flags	Date Taken	Date Analyzed	Time Analyzed	Analyst	Analysis Method
606706 TMW-3D Project #98-022								
Arsenic, GFAA	0.0086	mg/L		02/21/2001	03/06/2001		gjv	EPA 206.2
Mercury,Cold Vapor	<0.00020	mg/L		02/21/2001	02/27/2001	10:27	lmc	EPA 245.1
Selenium, GFAA	<0.0050	mg/L		02/21/2001	03/01/2001		gjv	EPA 270.2
ICP Metals - SW-6010B	Complete			02/21/2001	03/01/2001		heh	SW 6010B
Barium, ICP	0.202	mg/L		02/21/2001	03/01/2001		heh	SW 6010B
Cadmium, ICP	<0.020	mg/L		02/21/2001	03/01/2001		heh	SW 6010B
Chromium, ICP	0.045	mg/L		02/21/2001	03/01/2001		heh	SW 6010B
Lead, ICP	0.51	mg/L		02/21/2001	03/01/2001		heh	SW 6010B
Silver, ICP	<0.020	mg/L		02/21/2001	03/01/2001		heh	SW 6010B
606707 TMW-4 Project #98-022								
Turbidity	341	NTU	RH	02/21/2001	02/26/2001		rmp	EPA 180.1
Arsenic, GFAA	0.0070	mg/L		02/21/2001	03/06/2001		gjv	EPA 206.2
Mercury,Cold Vapor	<0.00020	mg/L		02/21/2001	02/27/2001	10:29	lmc	EPA 245.1
Selenium, GFAA	<0.0050	mg/L		02/21/2001	03/01/2001		gjv	EPA 270.2
ICP Metals - SW-6010B	Complete			02/21/2001	03/01/2001		heh	SW 6010B
Barium, ICP	0.148	mg/L		02/21/2001	03/01/2001		heh	SW 6010B

Key to Flags:
RH - Received at lab past the holding time for this analyte

Kristin Clay
Kristin M. Clay
Operations Manager
Iowa Lab Certification - 7

TestAmerica
INCORPORATED

ANALYTICAL REPORT

Carol Wilson
CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

03/07/2001

Date Received: 02/24/2001
Job Number: 01.01863

	Result	Units	Flags	Date Taken	Date Analyzed	Time Analyzed	Analyst	Analysis Method
606707 TMW-4	Project #98-022							
Cadmium, ICP	<0.020	mg/L		02/21/2001	03/01/2001		heh	SW 6010B
Chromium, ICP	0.058	mg/L		02/21/2001	03/01/2001		heh	SW 6010B
Lead, ICP	<0.10	mg/L		02/21/2001	03/01/2001		heh	SW 6010B
Silver, ICP	<0.020	mg/L		02/21/2001	03/01/2001		heh	SW 6010B

Key to Flags:

Kristin Clay
Kristin M. Clay
Operations Manager
Iowa Lab Certification - 7

TestAmerica INCORPORATED

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613

Phone: 319-277-2401
Fax: 319-277-2425

To assist us in using the proper analytical methods, is this work being conducted for regulatory purposes?
Compliance Monitoring RCRA Closure

Client Name: CHEM-ECO Client #:
Address: P.O. Box 367 Project Name:
City/State/Zip Code: Anamosa IA 52205 Project #: 98-022
Project Manager: Carol Wilson Site/Location ID: State:
Telephone Number: 319-484-2618 Fax: 2430 Report To: Carol Wilson
Sampler Name: (Print Name) Carol E Wilson Invoice To: CHEM-ECO
Sampler Signature: Quote #: PO#:

TAT: ✓ Standard; ___ Rush (surcharges may apply)
Date Needed:
Fax Results: Y N

QC Deliverables: ___ None; ___ Level 2 (Batch QC); ___ Level 3; ___ Level 4; Other:

SAMPLE ID	Date Sampled	Time Sampled	G = Grab, C = Composite	Field Filtered	Matrix: SL - Sludge DW - Drinking Water GW - Groundwater S - Soil/Solid WW - Wastewater Specify Other	Preservation & # of Containers: HNO_3	HCl	NaOH	H_2SO_4	Methanol	None	Other (Specify)	Analyze For: TCLP lead	Total lead *	8 RCRA metals **	Turbidity	REMARKS
C-W-2	10-17-00		G		S						✓		✓	✓			
B-2-3	10-17-00		G		S								✓				
B-3-3	10-17-00		G		S								✓				
B-4-3	10-17-00		G		S								✓				
TMW-1	2-21-01	1130	G		GW	✓					✓				✓	✓	
TMW-2	2-21-01	1100	G		GW	✓					✓				✓	✓	
TMW-3	2-21-01	1130	G		GW	✓					✓				✓	✓	
TMW-3D	2-21-01	1130	G		GW	✓					✓				✓	✓	
TMW-4	2-21-01	1230	G		GW	✓					✓				✓	✓	

Special Instructions:
* Total lead by BOTH AA and ICP.
** Ba, As, Cd, Cr, Pb, Hg, Ag, Se water samples

Relinquished By	Date	Time	Received By	Date	Time
Carol E Wilson			Melanie Freeman	2/21/01	930

LABORATORY COMMENTS:
Init Lab Temp:
Rec Lab Temp:
Custody Seals: Y N N/A
Bottles Supplied by TestAmerica: Y N
Method of Shipment:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VII
901 NORTH 5TH STREET
KANSAS CITY, KANSAS 66101

APR 0 5 2001

Dr. John Tyrrell
Hawkeye Castings, Inc/Tyrrell Investments, Inc.
410 North Franklin
Manchester, Iowa 52057

Dear Dr. Tyrrell:

RE: Split Sample Results
Hawkeye Castings, Inc./ a/k/a Tyrrell Investments, Inc.
Manchester, Iowa
EPA RCRA ID No. IAD984599589
Docket No. VII-97-H-0008

Please find enclosed, the analytical results of the split samples collected by the USGS on February 21, 2001. If you have any questions concerning this letter, please contact me at (913) 551-7657.

Sincerely,

Mary Reilly Grisolano, P.E.
RCRA Corrective Action and Permits Branch
Air, RCRA, and Toxics Division

Enclosure

cc: Carol Wilson, Chemeco

United States Environmental Protection Agency

Region 7 Laboratory
25 Funston Road
Kansas City, KS 66115

Date: 3/19/2001

Subject: Transmittal of Sample Analysis Results for ASR #: 880
Activity Number: CAT02
Activity Description: Hawkeye Castings Inc.

From: Michael Thomas, Associate Laboratory Director
Regional Laboratory, Environmental Services Division

To: Mary Grisolano
ARTD/RCAP

This is the sample analysis results transmittal for the above-referenced Analytical Services Request (ASR). The data contained in this transmittal have been approved by the Regional Laboratory. This transmittal contains all of the sample analysis results for this ASR. The Regional Laboratory should be notified within 14 days if any changes are needed to the contents of this report. If you have any questions, comments or data changes, please contact the Laboratory Customer Service Department at 913-551-5295.

cc: Analytical Data File

Activity Number: CAT02 **ASR Number:** 880 **Sample Information Summary**

Activity Desc: Hawkeye Castings Inc. **3/19/2001**

Sample Number	QC Code	Matrix	Location	External Sample No.	Start Date	Start Time	End Date	End Time	Receipt Date
1	__	Water	Monitoring well/MW-4		02/21/2001	12:30	02/21/2001	12:30	02/23/2001
2	__	Water	Monitoring well #3 - Closest to H.C. main building		02/21/2001	11:30	02/21/2001	12:00	02/23/2001
2	FD	Water	Monitoring well #3-Closest to H.C. main building/Duplicate of sample 2		02/21/2001	11:30	02/21/2001	12:00	02/23/2001
3	__	Soil	Sidewall sample from the pit at S-10 (East wall)		02/21/2001	14:00			02/23/2001

Activity Number: CAT02 **ASR Number:** 880 **RLAB Approved Sample Analysis Results**

Activity Desc: Hawkeye Castings Inc. **3/19/2001**

Analysis / Analyte	Units	1- MW-4	2- MW-3	2-FD MW-3D	3- S-10-2
Percent Solid					
Solids, percent	%				92.7
TCLP Metals in Soil					
Lead	mg/L				0.0914
Total Metals Analysis of TCLP Metals in Soil by ICAP					
Lead	mg/kg				44.7
Arsenic in Water by AA					
Arsenic	ug/L	8.24	21.9	20.9	
Lead in Water by AA					
Lead	ug/L	16.5	517	594	
Mercury in Water					
Mercury	ug/L	0.168	0.115	0.100 U	
Metals in Water by ICP					
Barium	ug/L	188	299	291	
Cadmium	ug/L	25.0	3.00 U	12.3	
Chromium	ug/L	43.2	40.4	52.3	
Silver	ug/L	25.0 U	25.0 U	25.0 U	
Selenium in Water by AA					
Selenium	ug/l	2.00 U	2.00 U	2.00 U	

CHAIN OF CUSTODY RECORD
ENVIRONMENTAL PROTECTION AGENCY REGION VII

ACTIVITY LEADER(Print)	NAME OF SURVEY OR ACTIVITY	DATE OF COLLECTION	SHEET
GRISOLANO	HAWKEYE CASTINGS CAT #1	21 (DAY) 02 (MONTH) 01 (YEAR)	1 of 1

CONTENTS OF SHIPMENT

SAMPLE NUMBER	TYPE OF CONTAINERS: CUBITAINER	BOTTLE	BOTTLE	BOTTLE	VOA SET (2 VIALS EA)	SAMPLED MEDIA: water	soil	sediment	dust	other	RECEIVING LABORATORY REMARKS/OTHER INFORMATION (condition of samples upon receipt, other sample numbers, etc.)
CAT#2	NUMBERS OF CONTAINERS PER SAMPLE NUMBER										
480-01	1					X					MW-4
02	1					X					MW-3
02FD	1					X					MW-3
X03			2x8oz				X				Soil Sample

Soil Sample Split from Previously-Collected Sample Collected from West Wall of Excavation Pit 5-10 @ 29-35' Below grade. Sample Prev. Collected on 10/17/00 & Preserved @ 4°C by Chem-Tech.

RSK Complete

Amb. Temp. Rec'd @ 5-6 °C.

DESCRIPTION OF SHIPMENT

____ PIECE(S) CONSISTING OF ____ BOX(ES)

✓ ICE CHEST(S); OTHER _____

MODE OF SHIPMENT

✓ COMMERCIAL CARRIER: Fed-EX

____ COURIER

____ SAMPLER CONVEYED

820951383840 (SHIPPING DOCUMENT NUMBER)

PERSONNEL CUSTODY RECORD 2/23/01

RELINQUISHED BY (SAMPLER)	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
[signature] SEALED UNSEALED	2/21/01 5:00 PM	5:00 PM	[signature] SEALED UNSEALED	Analysis
RELINQUISHED BY	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
SEALED UNSEALED			SEALED UNSEALED	
RELINQUISHED BY	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
SEALED UNSEALED			SEALED UNSEALED	

Sample Collection Field Sheet

US EPA Region VII
Kansas City, KS

ASR Number: 880 **Sample Number:** 2 **QC Code:** __ **Matrix:** Water **Tag ID:** 880-2-__

Activity Number: CAT02 **Activity Leader:** Grisolano, Mary
Activity Desc: Hawkeye Castings Inc.
Location: Manchester **State:** Iowa **Type:** RCRA

Location Desc: Monitoring Well # 3 - Closest to HCI Main Building
STORET ID: _____ **External Sample Number:** _____
Expected Conc: Circle One: Low Medium High
Latitude: ___ ___ ___
Longitude: ___ ___ ___

Sample Collection:	Date	Time (24 Hr)
Start	2/12/01	11:30
End	2/12/01	12:00

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 Liter Cubitainer	5 mL of HNO3/L to pH<2	180 Days	Mercury in Water
1 - 1 Liter Cubitainer	HNO3 acidify, 4 Deg C	180 Days	Arsenic in Water by AA Lead in Water by AA Selenium in Water by AA
1 - 1 Liter Cubitainer	HNO3 acidify, 4 Deg C	180 Days	Metals in Water by ICP

1 cubie collected

Sample Comments: One cubie collected per O.K. w/ Nicole Robley, well is low-yield.

Caldwell

Sample collected by: J. Caldwell

Sample Collection Field Sheet

US EPA Region VII
Kansas City, KS

ASR Number: 880 **Sample Number:** ~~4~~ 3 **QC Code:** __ **Matrix:** ~~Water~~ Soil **Tag ID:** 880-~~4~~3

Activity Number: CAT02 **Activity Leader:** Grisolano, Mary
Activity Desc: Hawkeye Castings Inc.
Location: Manchester **State:** Iowa **Type:** RCRA

Location Desc: Split of Previously-Collected (10/17/00) Soil Sample
STORET ID: ____________ **External Sample Number:** ____________
Expected Conc: Circle One: Low Medium High
Latitude: __ __ __ **Sample Collection:** Start Date 2/21/01 Time (24 Hr) 2:00
Longitude: __ __ __ End __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	~~Analysis~~
~~1 - 1 Liter Cubitainer~~	~~5 mL of HNO3/L to pH<2~~	~~180 Days~~	~~Mercury in Water~~
~~1 - 1 Liter Cubitainer~~	~~HNO3 acidify, 4 Deg C~~	~~180 Days~~	~~Arsenic in Water by AA~~
			~~Lead in Water by AA~~
			~~Selenium in Water by AA~~
1 - 1 ~~Liter~~ Cubitainer	HNO3 acidify, 4 Deg C	180 Days	Metals in Water by ICP

TOTAL + TCLP LEAD in Soil
2 x 8 oz Jars
add % solids.
2/23/01.

Sample Comments:

Split of Prev. Collected (Oct 17, 00) Soil Sample from Pit @ Monitoring well MW-3 Pit (5-10). Sample was Collected from West wall of Pit (5-10) @ A depth of 29-35" below grade. Foundry sand + native soil. Analyze for TOTAL LEAD AND TCLP LEAD, IF Possible

2 X 8 oz Jars Collected

Sample collected by: J. Caldwell

Appendix I

Soil and Groundwater Analytical Reports
Closure Activities 26 April 2001

TestAmerica
INCORPORATED

ANALYTICAL AND QUALITY CONTROL REPORT

Carol Wilson
CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

05/15/2001

Job Number: 01.04653

Enclosed is the Analytical and Quality Control reports for the following samples submitted to the Cedar Falls Division of TestAmerica, Inc. for analysis.

Sample Number	Sample Description		Date Taken	Date Received
616989	TMW-1	Project #98-022	04/26/2001	04/27/2001
616990	TMW-2	Project #98-022	04/26/2001	04/27/2001
616991	TMW-3	Project #98-022	04/26/2001	04/27/2001
616992	TMW-4	Project #98-022	04/26/2001	04/27/2001
616993	B-2-L-1	Project #98-022	04/26/2001	04/27/2001
616994	B-2-L-2	Project #98-022	04/26/2001	04/27/2001
616995	B-3-L-1	Project #98-022	04/26/2001	04/27/2001
616996	B-3-L-2	Project #98-022	04/26/2001	04/27/2001
616997	B-4-L-1	Project #98-022	04/26/2001	04/27/2001
616998	B-5-L-1	Project #98-022	04/26/2001	04/27/2001
616999	B-5-L-1D	Project #98-022	04/26/2001	04/27/2001
617000	S-10-L-1	Project #98-022	04/26/2001	04/27/2001
617001	C-11-4-1	Project #98-022	04/26/2001	04/27/2001
617002	C-11-4-2	Project #98-022	04/26/2001	04/27/2001
617003	C-11-4-3	Project #98-022	04/26/2001	04/27/2001
617004	C-11-4-4	Project #98-022	04/26/2001	04/27/2001
617005	B-2-4-1	Project #98-022	04/26/2001	04/27/2001
617006	B-2-4-2	Project #98-022	04/26/2001	04/27/2001
617007	B-2-4-3	Project #98-022	04/26/2001	04/27/2001
617008	B-2-4-4	Project #98-022	04/26/2001	04/27/2001

The Quality Control report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

TestAmerica, Inc. certifies that the analytical results contained herein apply only to the specific samples analyzed.

Kristin Clancy
Project Manager

ANALYTICAL AND QUALITY CONTROL REPORT

Carol Wilson
CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

05/15/2001

Job Number: 01.04653

Enclosed is the Analytical and Quality Control reports for the following samples submitted to the Cedar Falls Division of TestAmerica, Inc. for analysis.

Sample Number	Sample Description	Date Taken	Date Received
617009	B-2-4-4D Project #98-022	04/26/2001	04/27/2001
617010	C-11-4 Project #98-022	04/26/2001	04/27/2001
617011	B-2-4 Project #98-022	04/26/2001	04/27/2001
617413	PD Water Project #98-022	04/26/2001	05/01/2001
617525	TMW-3D Project #98-022	04/26/2001	05/02/2001

The Quality Control report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

TestAmerica, Inc. certifies that the analytical results contained herein apply only to the specific samples analyzed.

kristin clay
Project Manager

ANALYTICAL REPORT

Carol Wilson
CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

05/15/2001

Job Number: 01.04653

Client Project ID: RCRA Closure #98-022

Analyte	Result	Flag	Units	Quantitation Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 616989	**SAMPLE DESCRIPTION TMW-1 Project #98-022**								**DATE-TIME TAKEN 04/26/2001**
Turbidity	16.8		NTU	1.0	04/30/2001	rmp		205	EPA 180.1
ICP Metals Prep	D		mg/L		05/03/2001	rmp	2389		
Arsenic, GFAA	<0.0010		mg/L	0.0010	05/14/2001	llw	2222	591	SW 7060A
Cadmium, GFAA	<0.0005		mg/L	0.0005	05/08/2001	llw	2222	735	SW 7131A
Lead, GFAA	<0.0040		mg/L	0.0040	05/11/2001	llw	2222	1362	SW 7421
Mercury,Cold Vapor	<0.00020		mg/L	0.00020	05/04/2001	heh		1948	EPA 245.1
Selenium, GFAA	<0.0050		mg/L	0.0050	05/10/2001	llw	2222	519	SW 7740
GFAA Total Metals Digestion	D				05/07/2001	rmp	2222		
ICP Metals - SW-6010B	Complete				05/04/2001	llw		3136	SW 6010B
Barium, ICP	0.055		mg/L	0.010	05/04/2001	llw	2389	3586	SW 6010B
Chromium, ICP	<0.020		mg/L	0.020	05/04/2001	llw	2389	3598	SW 6010B
Silver, ICP	<0.020		mg/L	0.020	05/04/2001	llw	2389	3594	SW 6010B
SAMPLE NO. 616990	**SAMPLE DESCRIPTION TMW-2 Project #98-022**								**DATE-TIME TAKEN 04/26/2001**
Turbidity	61.2		NTU	1.0	04/30/2001	rmp		205	EPA 180.1
ICP Metals Prep	D		mg/L		05/03/2001	rmp	2389		
Arsenic, GFAA	0.0011		mg/L	0.0010	05/14/2001	llw	2222	591	SW 7060A
Cadmium, GFAA	<0.0005		mg/L	0.0005	05/08/2001	llw	2222	735	SW 7131A
Lead, GFAA	<0.0040		mg/L	0.0040	05/11/2001	llw	2222	1362	SW 7421
Mercury,Cold Vapor	<0.00020		mg/L	0.00020	05/04/2001	heh		1948	EPA 245.1
Selenium, GFAA	<0.0050		mg/L	0.0050	05/10/2001	llw	2222	519	SW 7740

ANALYTICAL REPORT

Carol Wilson
CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

05/15/2001

Job Number: 01.04653

Client Project ID: RCRA Closure #98-022

Analyte	Result	Flag	Units	Quantitation Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 616990 SAMPLE DESCRIPTION TMW-2 Project #98-022 DATE-TIME TAKEN 04/26/2001									
GFAA Total Metals Digestion	D				05/07/2001	rmp	2222		
ICP Metals - SW-6010B	Complete				05/04/2001	llw		3136	SW 6010B
Barium, ICP	0.060		mg/L	0.010	05/04/2001	llw	2389	3586	SW 6010B
Chromium, ICP	<0.020		mg/L	0.020	05/04/2001	llw	2389	3598	SW 6010B
Silver, ICP	<0.020		mg/L	0.020	05/04/2001	llw	2389	3594	SW 6010B
SAMPLE NO. 616991 SAMPLE DESCRIPTION TMW-3 Project #98-022 DATE-TIME TAKEN 04/26/2001									
Turbidity	1.5		NTU	1.0	04/30/2001	rmp		205	EPA 180.1
ICP Metals Prep	D		mg/L		05/03/2001	rmp	2389		
Arsenic, GFAA	<0.0010		mg/L	0.0010	05/14/2001	llw	2222	591	SW 7060A
Cadmium, GFAA	<0.0005		mg/L	0.0005	05/08/2001	llw	2222	735	SW 7131A
Lead, GFAA	<0.0040		mg/L	0.0040	05/11/2001	llw	2222	1362	SW 7421
Mercury,Cold Vapor	<0.00020		mg/L	0.00020	05/04/2001	heh		1948	EPA 245.1
Selenium, GFAA	<0.0050		mg/L	0.0050	05/10/2001	llw	2222	519	SW 7740
GFAA Total Metals Digestion	D				05/07/2001	rmp	2222		
ICP Metals - SW-6010B	Complete				05/04/2001	llw		3136	SW 6010B
Barium, ICP	0.033		mg/L	0.010	05/04/2001	llw	2389	3586	SW 6010B
Chromium, ICP	<0.020		mg/L	0.020	05/04/2001	llw	2389	3598	SW 6010B
Silver, ICP	<0.020		mg/L	0.020	05/04/2001	llw	2389	3594	SW 6010B

ANALYTICAL REPORT

Carol Wilson
CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

05/15/2001

Job Number: 01.04653

Client Project ID: RCRA Closure #98-022

Analyte	Result	Flag	Units	Quantitation Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 616992 SAMPLE DESCRIPTION TMW-4 Project #98-022 DATE-TIME TAKEN 04/26/2001									
Turbidity	68.1		NTU	1.0	04/30/2001	rmp		205	EPA 180.1
ICP Metals Prep	D		mg/L		05/03/2001	rmp	2389		
Arsenic, GFAA	0.0045		mg/L	0.0010	05/14/2001	llw	2222	591	SW 7060A
Cadmium, GFAA	<0.0005		mg/L	0.0005	05/08/2001	llw	2222	735	SW 7131A
Lead, GFAA	<0.0040		mg/L	0.0040	05/11/2001	llw	2222	1362	SW 7421
Mercury,Cold Vapor	<0.00020		mg/L	0.00020	05/04/2001	heh		1948	EPA 245.1
Selenium, GFAA	<0.0050		mg/L	0.0050	05/10/2001	llw	2222	519	SW 7740
GFAA Total Metals Digestion	D				05/07/2001	rmp	2222		
ICP Metals - SW-6010B	Complete				05/04/2001	llw		3136	SW 6010B
Barium, ICP	0.090		mg/L	0.010	05/04/2001	llw	2389	3586	SW 6010B
Chromium, ICP	<0.020		mg/L	0.020	05/04/2001	llw	2389	3598	SW 6010B
Silver, ICP	<0.020		mg/L	0.020	05/04/2001	llw	2389	3594	SW 6010B
SAMPLE NO. 616993 SAMPLE DESCRIPTION B-2-L-1 Project #98-022 DATE-TIME TAKEN 04/26/2001									
ICP Metals Prep (Solid)	Complete	BA	g		05/01/2001	lmc	999		
ICP Metals-Solid	Complete		mg/kg		05/04/2001	lmc		1205	SW 6010B
Lead, ICP	34	BA	mg/kg	5.0	05/04/2001	lmc	999	1356	SW 6010B

BA - Analysis subcontracted to TestAmerica Bartlett Division

ANALYTICAL REPORT

Carol Wilson
CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

05/15/2001

Job Number: 01.04653

Client Project ID: RCRA Closure #98-022

Analyte	Result	Flag	Units	Quantitation Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 616994	SAMPLE DESCRIPTION B-2-L-2 Project #98-022							DATE-TIME TAKEN 04/26/2001	
ICP Metals Prep (Solid)	Complete	BA	g		05/01/2001	lmc	999		
ICP Metals-Solid	Complete		mg/kg		05/04/2001	lmc		1205	SW 6010B
Lead, ICP	22	BA	mg/kg	5.0	05/04/2001	lmc	999	1356	SW 6010B
SAMPLE NO. 616995	SAMPLE DESCRIPTION B-3-L-1 Project #98-022							DATE-TIME TAKEN 04/26/2001	
ICP Metals Prep (Solid)	Complete	BA	g		05/01/2001	lmc	999		
ICP Metals-Solid	Complete		mg/kg		05/04/2001	lmc		1205	SW 6010B
Lead, ICP	15	BA	mg/kg	5.0	05/04/2001	lmc	999	1356	SW 6010B
SAMPLE NO. 616996	SAMPLE DESCRIPTION B-3-L-2 Project #98-022							DATE-TIME TAKEN 04/26/2001	
ICP Metals Prep (Solid)	Complete	BA	g		05/01/2001	lmc	999		
ICP Metals-Solid	Complete		mg/kg		05/04/2001	lmc		1205	SW 6010B
Lead, ICP	15	BA	mg/kg	5.0	05/04/2001	lmc	999	1356	SW 6010B

BA - Analysis subcontracted to TestAmerica Bartlett Division

ANALYTICAL REPORT

Carol Wilson
CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

05/15/2001

Job Number: 01.04653

Client Project ID: RCRA Closure #98-022

Analyte	Result	Flag	Units	Quantitation Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 616997	SAMPLE DESCRIPTION B-4-L-1 Project #98-022							DATE-TIME TAKEN 04/26/2001	
ICP Metals Prep (Solid)	Complete	BA	g		05/01/2001	lmc	999		
ICP Metals-Solid	Complete		mg/kg		05/04/2001	lmc		1205	SW 6010B
Lead, ICP	25	BA	mg/kg	5.0	05/04/2001	lmc	999	1356	SW 6010B
SAMPLE NO. 616998	SAMPLE DESCRIPTION B-5-L-1 Project #98-022							DATE-TIME TAKEN 04/26/2001	
ICP Metals Prep (Solid)	Complete	BA	g		05/01/2001	lmc	999		
ICP Metals-Solid	Complete	BA			05/04/2001	lmc		1205	SW 6010B
Lead, ICP	19	BA	mg/kg	5.0	05/04/2001	lmc	999	1356	SW 6010B
SAMPLE NO. 616999	SAMPLE DESCRIPTION B-5-L-1D Project #98-022							DATE-TIME TAKEN 04/26/2001	
ICP Metals Prep (Solid)	Complete	BA	g		05/01/2001	lmc	999		
ICP Metals-Solid	Complete		mg/kg		05/04/2001	lmc		1205	SW 6010B
Lead, ICP	19	BA	mg/kg	5.0	05/04/2001	lmc	999	1356	SW 6010B

BA - Analysis subcontracted to TestAmerica Bartlett Division

ANALYTICAL REPORT

Carol Wilson
CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

05/15/2001

Job Number: 01.04653

Client Project ID: RCRA Closure #98-022

Analyte	Result	Flag	Units	Quantitation Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 617000 SAMPLE DESCRIPTION S-10-L-1 Project #98-022 DATE-TIME TAKEN 04/26/2001									
ICP Metals Prep (Solid)	Complete	BA	g		05/01/2001	lmc	999		
ICP Metals-Solid	Complete		mg/kg		05/04/2001	lmc		1205	SW 6010B
Lead, ICP	15	BA	mg/kg	5.0	05/04/2001	lmc	999	1356	SW 6010B
SAMPLE NO. 617001 SAMPLE DESCRIPTION C-11-4-1 Project #98-022 DATE-TIME TAKEN 04/26/2001									
ICP Metals Prep (Solid)	Complete	BA	g		05/01/2001	lmc	999		
ICP Metals-Solid	Complete		mg/kg		05/04/2001	lmc		1205	SW 6010B
Lead, ICP	68	BA	mg/kg	5.0	05/04/2001	lmc	999	1356	SW 6010B
SAMPLE NO. 617002 SAMPLE DESCRIPTION C-11-4-2 Project #98-022 DATE-TIME TAKEN 04/26/2001									
ICP Metals Prep (Solid)	Complete	BA	g		05/01/2001	lmc	999		
ICP Metals-Solid	Complete		mg/kg		05/04/2001	lmc		1205	SW 6010B
Lead, ICP	240	MSOM,BA	mg/kg	5.0	05/02/2001	lmc	999	1355	SW 6010B

BA - Analysis subcontracted to TestAmerica Bartlett Division
M - Duplicate (or MS/MSD) RPD is greater than 20%
MSO - MS and/or MSD are out of control for this analyte

ANALYTICAL REPORT

Carol Wilson
CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

05/15/2001

Job Number: 01.04653

Client Project ID: RCRA Closure #98-022

Analyte	Result	Flag	Units	Quantitation Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 617003	SAMPLE DESCRIPTION C-11-4-3 Project #98-022							DATE-TIME TAKEN 04/26/2001	
ICP Metals Prep (Solid)	Complete	BA	g		05/01/2001	lmc	999		
ICP Metals-Solid	Complete		mg/kg		05/04/2001	lmc		1205	SW 6010B
Lead, ICP	270	BA	mg/kg	5.0	05/04/2001	lmc	999	1356	SW 6010B
SAMPLE NO. 617004	SAMPLE DESCRIPTION C-11-4-4 Project #98-022							DATE-TIME TAKEN 04/26/2001	
ICP Metals Prep (Solid)	Complete	BA	g		05/01/2001	lmc	999		
ICP Metals-Solid	Complete		mg/kg		05/04/2001	lmc		1205	SW 6010B
Lead, ICP	240	BA	mg/kg	5.0	05/04/2001	lmc	999	1356	SW 6010B
SAMPLE NO. 617005	SAMPLE DESCRIPTION B-2-4-1 Project #98-022							DATE-TIME TAKEN 04/26/2001	
ICP Metals Prep (Solid)	Complete	BA	g		05/01/2001	lmc	999		
ICP Metals-Solid	Complete		mg/kg		05/04/2001	lmc		1205	SW 6010B
Lead, ICP	31	BA	mg/kg	5.0	05/04/2001	lmc	999	1356	SW 6010B

BA - Analysis subcontracted to TestAmerica Bartlett Division

ANALYTICAL REPORT

Carol Wilson
CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

05/15/2001

Job Number: 01.04653

Client Project ID: RCRA Closure #98-022

Analyte	Result	Flag	Units	Quantitation Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 617006	**SAMPLE DESCRIPTION B-2-4-2 Project #98-022**								**DATE-TIME TAKEN 04/26/2001**
ICP Metals Prep (Solid)	Complete	BA	g		05/01/2001	lmc	999		
ICP Metals-Solid	Complete		mg/kg		05/04/2001	lmc		1205	SW 6010B
Lead, ICP	65	BA	mg/kg	5.0	05/04/2001	lmc	999	1356	SW 6010B
SAMPLE NO. 617007	**SAMPLE DESCRIPTION B-2-4-3 Project #98-022**								**DATE-TIME TAKEN 04/26/2001**
ICP Metals Prep (Solid)	Complete	BA	g		05/01/2001	lmc	999		
ICP Metals-Solid	Complete		mg/kg		05/04/2001	lmc		1205	SW 6010B
Lead, ICP	57	BA	mg/kg	5.0	05/04/2001	lmc	999	1356	SW 6010B
SAMPLE NO. 617008	**SAMPLE DESCRIPTION B-2-4-4 Project #98-022**								**DATE-TIME TAKEN 04/26/2001**
ICP Metals Prep (Solid)	Complete	BA	g		05/02/2001	lmc	1000		
ICP Metals-Solid	Complete		mg/kg		05/04/2001	lmc		1205	SW 6010B
Lead, ICP	41	BA	mg/kg	5.0	05/04/2001	lmc	1000	1356	SW 6010B

BA - Analysis subcontracted to TestAmerica Bartlett Division

ANALYTICAL REPORT

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05/15/2001

Job Number: 01.04653

Client Project ID: RCRA Closure #98-022

Analyte	Result	Flag	Units	Quantitation Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 617009 SAMPLE DESCRIPTION B-2-4-4D Project #98-022									**DATE-TIME TAKEN 04/26/2001**
ICP Metals Prep (Solid)	Complete	BA	g		05/02/2001	lmc	1000		
ICP Metals-Solid	Complete		mg/kg		05/04/2001	lmc		1205	SW 6010B
Lead, ICP	63	BA	mg/kg	5.0	05/04/2001	lmc	1000	1356	SW 6010B
SAMPLE NO. 617010 SAMPLE DESCRIPTION C-11-4 Project #98-022									**DATE-TIME TAKEN 04/26/2001**
Solid pH Measured in Water	7.7		units	0.1	05/01/2001	sas		1190	SW 9045
Solids, Total	87.97		%	0.01	04/30/2001	sas		1831	SM 2540 G
TCLP Metals Digest	Complete				05/04/2001	llw	1548		
TCLP - Mercury	<0.0020		mg/L	0.0020	05/09/2001	heh		841	SW 7470
ICP TCLP METALS									
TCLP Arsenic (ICP)	<0.150		mg/L	0.150	05/04/2001	heh	1548	1376	SW 6010B
TCLP Barium (ICP)	0.691		mg/L	0.100	05/04/2001	heh	1548	1374	SW 6010B
TCLP Cadmium (ICP)	<0.020		mg/L	0.020	05/04/2001	heh	1548	1377	SW 6010B
TCLP Chromium (ICP)	<0.020		mg/L	0.020	05/04/2001	heh	1548	1374	SW 6010B
TCLP Lead (ICP)	0.25		mg/L	0.10	05/04/2001	heh	1548	1377	SW 6010B
TCLP Selenium (ICP)	<0.15		mg/L	0.15	05/04/2001	heh	1548	1376	SW 6010B
TCLP Silver (ICP)	<0.020		mg/L	0.020	05/04/2001	heh	1548	1373	SW 6010B
TCLP EXTRACTION	complete				05/02/2001	jlc	1247		SW 1311

BA - Analysis subcontracted to TestAmerica Bartlett Division

ANALYTICAL REPORT

Carol Wilson
CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

05/15/2001

Job Number: 01.04653

Client Project ID: RCRA Closure #98-022

Analyte	Result	Flag	Units	Quantitation Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 617011 SAMPLE DESCRIPTION B-2-4 Project #98-022 DATE-TIME TAKEN 04/26/2001									
Solid pH Measured in Water	7.7		units	0.1	05/01/2001	sas		1190	SW 9045
Solids, Total	91.63		%	0.01	04/30/2001	sas		1831	SM 2540 G
TCLP Metals Digest	Complete				05/04/2001	llw	1548		
TCLP - Mercury	<0.0020		mg/L	0.0020	05/09/2001	heh		841	SW 7470
ICP TCLP METALS									
TCLP Arsenic (ICP)	<0.150		mg/L	0.150	05/04/2001	heh	1548	1376	SW 6010B
TCLP Barium (ICP)	0.472		mg/L	0.100	05/04/2001	heh	1548	1374	SW 6010B
TCLP Cadmium (ICP)	<0.020		mg/L	0.020	05/04/2001	heh	1548	1377	SW 6010B
TCLP Chromium (ICP)	<0.020		mg/L	0.020	05/04/2001	heh	1548	1374	SW 6010B
TCLP Lead (ICP)	3.09		mg/L	0.10	05/04/2001	heh	1548	1377	SW 6010B
TCLP Selenium (ICP)	<0.15		mg/L	0.15	05/04/2001	heh	1548	1376	SW 6010B
TCLP Silver (ICP)	<0.020		mg/L	0.020	05/04/2001	heh	1548	1373	SW 6010B
TCLP EXTRACTION	complete				05/02/2001	jlc	1247		SW 1311
SAMPLE NO. 617413 SAMPLE DESCRIPTION PD Water Project #98-022 DATE-TIME TAKEN 04/26/2001									
Lead, GFAA	<0.0040		mg/L	0.0040	05/11/2001	llw	2222	1362	SW 7421
GFAA Total Metals Digestion	D				05/07/2001	rmp	2222		

ANALYTICAL REPORT

Carol Wilson
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05/15/2001

Job Number: 01.04653

Client Project ID: RCRA Closure #98-022

Analyte	Result	Flag	Units	Quantitation Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 617525	SAMPLE DESCRIPTION TMW-3D Project #98-022							DATE-TIME TAKEN 04/26/2001	
ICP Metals Prep	D		mg/L		05/04/2001	llw	2390		
Arsenic, GFAA	<0.0010		mg/L	0.0010	05/14/2001	llw	2222	591	SW 7060A
Cadmium, GFAA	<0.0005		mg/L	0.0005	05/08/2001	llw	2222	735	SW 7131A
Lead, GFAA	<0.0040		mg/L	0.0040	05/11/2001	llw	2222	1362	SW 7421
Mercury,Cold Vapor	<0.00020		mg/L	0.00020	05/11/2001	heh		1953	EPA 245.1
Selenium, GFAA	<0.0050		mg/L	0.0050	05/10/2001	llw	2222	519	SW 7740
GFAA Total Metals Digestion	D				05/07/2001	rmp	2222		
ICP Metals - SW-6010B	Complete				05/04/2001	llw		3137	SW 6010B
Barium, ICP	0.032		mg/L	0.010	05/04/2001	llw	2390	3587	SW 6010B
Chromium, ICP	<0.020		mg/L	0.020	05/04/2001	llw	2390	3599	SW 6010B
Silver, ICP	<0.020		mg/L	0.020	05/04/2001	llw	2390	3595	SW 6010B

QUALITY CONTROL REPORT
CONTINUING CALIBRATION VERIFICATION

Carol Wilson
CHEM-ECO ENGINEERS, INC.
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05/15/2001

Job Number: 01.04653

Analyte	Prep Batch No.	Run Batch No.	CCV True Value	Units	CCV Conc Found	CCV % Rec	Flag	Date Analyzed
Solid pH Measured in Water		1190	4.00	units	4.00	100		05/01/2001
Solid pH Measured in Water		1190	4.00	units	4.06	102		05/01/2001
Solid pH Measured in Water		1190	4.00	units	4.06	102		05/01/2001
Solid pH Measured in Water		1190	4.00	units	4.05	101		05/01/2001
Arsenic, GFAA		591	0.0250	mg/L	0.0264	106		05/14/2001
Cadmium, GFAA		735	0.0010	mg/L	0.00096	96		05/08/2001
Lead, GFAA		1362	0.0250	mg/L	0.0245	98		05/11/2001
Lead, GFAA		1362	0.0250	mg/L	0.0240	96		05/11/2001
Mercury,Cold Vapor		1948	1.00	ppb	1.06	106		05/04/2001
Mercury,Cold Vapor		1948	1.00	ppb	1.06	106		05/04/2001
Mercury,Cold Vapor		1948	1.00	ppb	1.07	107		05/04/2001
Mercury,Cold Vapor		1953	1.00	ppb	1.03	103		05/11/2001
Mercury,Cold Vapor		1953	1.00	ppb	1.03	103		05/11/2001
Selenium, GFAA		519	0.0250	mg/L	0.0253	101		05/10/2001
ICP Metals-Solid		1205	1.0	mg/kg	1.0	100		05/04/2001
Lead, ICP		1355	2.00	mg/L	2.00	100		05/02/2001
Lead, ICP		1356	2.00	mg/L	2.02	101		05/04/2001
ICP Metals - SW-6010B		3136			Complete			05/04/2001
Barium, ICP		3586	5.00	ppm	5.01	100		05/04/2001
Barium, ICP		3586	5.00	ppm	4.99	100		05/04/2001
Barium, ICP		3586	5.00	ppm	4.99	100		05/04/2001
Barium, ICP		3587	5.00	ppm	4.91	98		05/04/2001
Barium, ICP		3587	5.00	ppm	4.96	99		05/04/2001
Barium, ICP		3587	5.00	ppm	4.93	99		05/04/2001
Chromium, ICP		3598	5.00	ppm	4.92	98		05/04/2001
Chromium, ICP		3598	5.00	ppm	4.90	98		05/04/2001
Chromium, ICP		3598	5.00	ppm	4.84	97		05/04/2001
Chromium, ICP		3599	5.00	ppm	4.94	99		05/04/2001
Chromium, ICP		3599	5.00	ppm	4.88	98		05/04/2001
Chromium, ICP		3599	5.00	ppm	4.92	98		05/04/2001
Silver, ICP		3594	1.00	ppm	1.01	101		05/04/2001
Silver, ICP		3594	1.00	ppm	1.01	101		05/04/2001

QUALITY CONTROL REPORT
CONTINUING CALIBRATION VERIFICATION

Carol Wilson
CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

05/15/2001

Job Number: 01.04653

Analyte	Prep Batch No.	Run Batch No.	CCV True Value	Units	CCV Conc Found	CCV % Rec	Flag	Date Analyzed
Silver, ICP		3594	1.00	ppm	1.00	100		05/04/2001
Silver, ICP		3595	1.00	ppm	1.02	102		05/04/2001
Silver, ICP		3595	1.00	ppm	1.01	101		05/04/2001
Silver, ICP		3595	1.00	ppm	1.01	101		05/04/2001
TCLP - Mercury		841	1.00	ppb	0.93	93		05/09/2001
ICP TCLP METALS								
TCLP Arsenic (ICP)		1376	5.00	mg/L	4.69	94		05/04/2001
TCLP Barium (ICP)		1374	5.00	mg/L	5.04	101		05/04/2001
TCLP Cadmium (ICP)		1377	5.00	mg/L	4.83	97		05/04/2001
TCLP Chromium (ICP)		1374	5.00	mg/L	4.85	97		05/04/2001
TCLP Lead (ICP)		1377	5.00	mg/L	4.79	96		05/04/2001
TCLP Selenium (ICP)		1376	5.00	mg/L	4.83	97		05/04/2001
TCLP Silver (ICP)		1373	1.00	mg/L	0.98	98		05/04/2001

QUALITY CONTROL REPORT
BLANKS

Carol Wilson
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05/15/2001

Job Number: 01.04653

Analyte	Prep Batch No.	Run Batch No.	Blank Value	Flag	Units	Quantitation Limit	Date Analyzed
Arsenic, GFAA	2222	591	<0.0010		mg/L	0.0010	05/14/2001
Cadmium, GFAA	2222	735	<0.0005		mg/L	0.0005	05/08/2001
Lead, GFAA	2222	1362	<0.0040		mg/L	0.0040	05/11/2001
Mercury,Cold Vapor		1948	<0.00020		mg/L	0.00020	05/04/2001
Mercury,Cold Vapor		1953	<0.00020		mg/L	0.00020	05/11/2001
Selenium, GFAA	2222	519	<0.0050		mg/L	0.0050	05/10/2001
ICP Metals-Solid		1205	Complete		mg/kg		05/04/2001
Lead, ICP	999	1355	<5.0		mg/kg	5.0	05/02/2001
Lead, ICP		1356	<5.0		mg/kg	5.0	05/04/2001
Lead, ICP	1000	1356	<5.0		mg/kg	5.0	05/04/2001
Barium, ICP	2389	3586	<0.010		mg/L	0.010	05/04/2001
Barium, ICP	2390	3587	<0.010		mg/L	0.010	05/04/2001
Chromium, ICP	2389	3598	<0.020		mg/L	0.020	05/04/2001
Chromium, ICP	2390	3599	<0.020		mg/L	0.020	05/04/2001
Silver, ICP	2389	3594	<0.020		mg/L	0.020	05/04/2001
Silver, ICP	2390	3595	<0.020		mg/L	0.020	05/04/2001
TCLP - Mercury		841	<0.0020		mg/L	0.0020	05/09/2001
TCLP Arsenic (ICP)	1548	1376	<0.150		mg/L	0.150	05/04/2001
TCLP Barium (ICP)	1548	1374	<0.100		mg/L	0.100	05/04/2001
TCLP Cadmium (ICP)	1548	1377	<0.020		mg/L	0.020	05/04/2001
TCLP Chromium (ICP)	1548	1374	<0.020		mg/L	0.020	05/04/2001
TCLP Lead (ICP)	1548	1377	<0.10		mg/L	0.10	05/04/2001
TCLP Selenium (ICP)	1548	1376	<0.15		mg/L	0.15	05/04/2001
TCLP Silver (ICP)	1548	1373	<0.020		mg/L	0.020	05/04/2001

QUALITY CONTROL REPORT
LABORATORY CONTROL STANDARD

Carol Wilson
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Anamosa, IA 52205

05/15/2001

Job Number: 01.04653

Analyte	Prep Batch No.	Run Batch No.	LCS True Conc	Units	LCS Conc Found	LCS % Rec.	Flag	Date Analyzed
Arsenic, GFAA	2222	591	0.040	mg/L	0.0382	96		05/14/2001
Cadmium, GFAA	2222	735	0.0200	mg/L	0.0176	88		05/08/2001
Lead, GFAA	2222	1362	0.0400	mg/L	0.0386	97		05/11/2001
Mercury,Cold Vapor		1948	0.00167	mg/L	0.00150	90		05/04/2001
Mercury,Cold Vapor		1953	0.00167	mg/L	0.00173	104		05/11/2001
Selenium, GFAA	2222	519	0.0800	mg/L	0.0834	104		05/10/2001
ICP Metals-Solid		1205	1.0	mg/kg	1.0	100		05/04/2001
Lead, ICP	999	1355	50.0	mg/kg	52.9	106		05/02/2001
Lead, ICP	1000	1356	50.0	mg/kg	49.6	99		05/04/2001
Barium, ICP	2389	3586	1.00	mg/L	0.98	98		05/04/2001
Barium, ICP	2390	3587	1.00	mg/L	0.98	98		05/04/2001
Chromium, ICP	2389	3598	1.00	mg/L	1.00	100		05/04/2001
Chromium, ICP	2390	3599	1.00	mg/L	1.00	100		05/04/2001
Silver, ICP	2389	3594	1.00	mg/L	1.03	103		05/04/2001
Silver, ICP	2390	3595	1.00	mg/L	1.04	104		05/04/2001
TCLP - Mercury		841	0.0167	mg/L	0.0168	101		05/09/2001
TCLP Arsenic (ICP)	1548	1376	2.00	mg/L	2.02	101		05/04/2001
TCLP Barium (ICP)	1548	1374	1.00	mg/L	0.96	96		05/04/2001
TCLP Cadmium (ICP)	1548	1377	1.00	mg/L	0.96	96		05/04/2001
TCLP Chromium (ICP)	1548	1374	1.00	mg/L	0.96	96		05/04/2001
TCLP Lead (ICP)	1548	1377	2.00	mg/L	1.90	95		05/04/2001
TCLP Selenium (ICP)	1548	1376	4.00	mg/L	4.31	108		05/04/2001
TCLP Silver (ICP)	1548	1373	1.00	mg/L	0.97	97		05/04/2001

QUALITY CONTROL REPORT
MATRIX SPIKE

Carol Wilson
CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

05/15/2001

Job Number: 01.04653

Analyte	Prep Batch No.	Run Batch No.	Conc. Spike Added	Units	Sample Result	Conc. MS Result	MS % Rec.	Flag	Date Analyzed
TCLP - Mercury		841	0.0167	mg/L	<0.0020	0.0147	88		05/09/2001
TCLP - Mercury		841	0.0167	mg/L	<0.0020	0.0156	93		05/09/2001
ICP TCLP METALS									
TCLP Arsenic (ICP)	1548	1376	2.00	mg/L	<0.900	1.70	85		05/04/2001
TCLP Arsenic (ICP)	1548	1376	2.00	mg/L	<0.150	2.01	101		05/04/2001
TCLP Barium (ICP)	1548	1374	1.00	mg/L	<0.60	0.9930	99		05/04/2001
TCLP Barium (ICP)	1548	1374	1.00	mg/L	0.691	1.65	96		05/04/2001
TCLP Cadmium (ICP)	1548	1377	1.00	mg/L	<0.120	0.9924	99		05/04/2001
TCLP Cadmium (ICP)	1548	1377	1.00	mg/L	<0.020	0.94	94		05/04/2001
TCLP Chromium (ICP)	1548	1374	1.00	mg/L	<0.120	0.9498	95		05/04/2001
TCLP Chromium (ICP)	1548	1374	1.00	mg/L	<0.020	0.96	96		05/04/2001
TCLP Lead (ICP)	1548	1377	2.00	mg/L	<0.60	1.99	100		05/04/2001
TCLP Lead (ICP)	1548	1377	2.00	mg/L	0.25	2.13	94		05/04/2001
TCLP Selenium (ICP)	1548	1376	4.00	mg/L	<0.90	3.97	99		05/04/2001
TCLP Selenium (ICP)	1548	1376	4.00	mg/L	<0.15	4.22	106		05/04/2001
TCLP Silver (ICP)	1548	1373		mg/L	<0.120				05/04/2001
TCLP Silver (ICP)	1548	1373	2.00	mg/L	<0.040	1.91	96		05/04/2001

QUALITY CONTROL REPORT
DUPLICATES

Carol Wilson
CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

05/15/2001

Job Number: 01.04653

Analyte	Prep Batch No.	Run Batch No.	Sample Result	Duplicate Sample Result	Units	RPD	Flag	Date Analyzed
Turbidity		205	1.5	1.3	NTU	14.3		04/30/2001
Solid pH Measured in Water		1190	10.1	10.0	units	1.0		05/01/2001
Solid pH Measured in Water		1190	7.6	7.6	units	0.0		05/01/2001
Solids, Total		1831	87.97	87.45	%	0.6		04/30/2001
Solids, Total		1831	4.06	4.06	%	0.0		04/30/2001

QUALITY CONTROL REPORT
MATRIX SPIKE/MATRIX SPIKE DUPLICATE

CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

05/15/2001

Carol Wilson

Job Number: 01.04653

Analyte	Prep Batch Number	Run Batch Number	Matrix Spike Result	Sample Result	Spike Amount	Units	Percent Recovery	MSD Result	MSD Spike Amount	Units	Percent Recovery	MS/MSD RPD
Arsenic, GFAA	2222	591	0.0397	0.0045	0.040	mg/L	88.0	0.0399	0.040	mg/L	88.5	0.5
Cadmium, GFAA	2222	735	0.0189	<0.0005	0.020	mg/L	94.5	0.0198	0.020	mg/L	99.0	4.7
Lead, GFAA	2222	1362	0.0322	<0.0040	0.040	mg/L	80.5	0.0331	0.040	mg/L	82.8	2.8
Mercury,Cold Vapor		1948	0.00176	<0.0002	0.0016	mg/L	105.4	0.0017	0.0016	mg/L	106.6	1.1
Mercury,Cold Vapor		1948	0.00185	<0.0002	0.0016	mg/L	110.8	0.0018	0.0016	mg/L	109.0	1.6
Mercury,Cold Vapor		1953	0.00178	<0.0002	0.0016	mg/L	106.6	0.0017	0.0016	mg/L	105.4	1.1
Selenium, GFAA	2222	519	0.0762	<0.0050	0.080	mg/L	95.3	0.0777	0.080	mg/L	97.1	1.9
ICP Metals-Solid		1205		Complet	1.0	mg/kg			1.0	mg/kg		
Lead, ICP	999	1355	369	240	47.2	mg/kg	273.3	298	47.2	mg/kg	122.9	21.3
Lead, ICP		1356	140	100	48.1	mg/kg	83.2	145	48.1	mg/kg	93.6	3.5
ICP Metals - SW-6010B		3136		Complet								
ICP Metals - SW-6010B		3136		Complet								
Barium, ICP	2389	3586	1.04	0.055	1.00	mg/L	98.5	1.03	1.00	mg/L	97.5	1.0
Barium, ICP	2390	3587	1.05	0.074	1.00	mg/L	97.6	1.05	1.00	mg/L	97.6	0.0
Chromium, ICP	2389	3598	1.00	<0.020	1.00	mg/L	100.0	0.99	1.00	mg/L	99.0	1.0
Chromium, ICP	2390	3599	1.00	<0.020	1.00	mg/L	100.0	0.99	1.00	mg/L	99.0	1.0

NOTE: Matrix Spike Samples may not be samples from this job.

Advisory Control Limits for MS/MSDs
Inorganic Parameters and GC Volatiles
The spike recovery should be 75 - 125% if the spike added value was greater than or equal to one fourth of the sample result value. If not, the control limits are not established. The RPD for the MS/MSD pair should be less than 20.

RPD = Relative Percent Difference

QUALITY CONTROL REPORT
MATRIX SPIKE/MATRIX SPIKE DUPLICATE

CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

05/15/2001

Carol Wilson

Job Number: 01.04653

Analyte	Prep Batch Number	Run Batch Number	Matrix Spike Result	Sample Result	Spike Amount	Units	Percent Recovery	MSD Result	MSD Spike Amount	Units	Percent Recovery	MS/MSD RPD
Silver, ICP	2390	3595	1.97	<0.040	2.00	mg/L	98.5		1.00	mg/L		

NOTE: Matrix Spike Samples may not be samples from this job.

Advisory Control Limits for MS/MSDs
Inorganic Parameters and GC Volatiles
The spike recovery should be 75 - 125% if the spike added value was greater than or equal to one fourth of the sample result value. If not, the control limits are not established. The RPD for the MS/MSD pair should be less than 20.

RPD = Relative Percent Difference

TestAmerica INCORPORATED

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613

Phone: 319-277-2401
Fax: 319-277-2425

To assist us in using the proper analytical methods, is this work being conducted for regulatory purposes?
Compliance Monitoring RCRA Closure

Client Name: CHEM-ECO Client #:
Address: P.O. Box 367 Project Name:
City/State/Zip Code: Anamosa IA 52205 Project #: 98-022
Project Manager: Carol Wilson Site/Location ID: State:
Telephone Number: 319 484 2618 Fax: 319 484 2930 Report To: Carol Wilson
Sampler Name: (Print Name) Carol E Wilson Invoice To:
Sampler Signature: Quote #: PO#:

TAT: ✓ Standard; ___ Rush (surcharges may apply)
Date Needed:
Fax Results: Y N

QC Deliverables: ___ None; ___ Level 2 (Batch QC); ___ Level 3; ___ Level 4; Other:

SAMPLE ID	Date Sampled	Time Sampled	G = Grab, C = Composite	Field Filtered	Matrix (SL - Sludge DW - Drinking Water; GW - Groundwater S - Soil/Solid; WW - Wastewater Specify Other)	Preservation & # of Containers: HNO_3	HCl	NaOH	H_2SO_4	Methanol	None	Other (Specify)	Analyze For: 8 RCRA metals: As, Cd, Cr, Ba, Pb, Hg, Ag, Se	Turbidity	Total lead	REMARKS
TMW-1	4.26.01	am	G		GW	✓					✓		✓	✓		
TMW-2	4.26.01	am	G		GW	✓					✓		✓	✓		
TMW-3	4.26.01	pm	G		GW	✓					✓		✓	✓		
TMW-3D	4.26.01	pm	G		GW	✓							✓			
TMW-4	4.26.01	pm	G		GW	✓					✓		✓	✓		
B-2-L-1	4.26.01	am	G		S						✓				✓	
B-2-L-2	4.26.01	am	G		S						✓				✓	
B-3-L-1	4.26.01	am	G		S						✓				✓	
B-3-L-2	4.26.01	am	G		S						✓				✓	
B-4-L-1	4.26.01	am	G		S						✓				✓	

Special Instructions: Please refer to table of methods + detection limits. Please let me know if detection limits cannot be met. HOLD samples for metals in water. Will notify after 4/30/01 to proceed.

LABORATORY COMMENTS:
Init Lab Temp:
Rec Lab Temp:
Custody Seals: Y N N/A
Bottles Supplied by TestAmerica: Y N
Method of Shipment:

	Date	Time		Date	Time
Relinquished By: Carol E Wilson	4/26/01	4p	Received By: Edna M Quellhorst	4/27/01	9:00
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:

TestAmerica INCORPORATED

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613

Phone: 319-277-2401
Fax: 319-277-2425

To assist us in using the proper analytical methods, is this work being conducted for regulatory purposes?
Compliance Monitoring RCRA Closure

Client Name: [redacted] CHEM-ECO Client #:
Address: P.O. Box 367 Project Name:
City/State/Zip Code: Anamosa IA 52205 Project #: 98-022
Project Manager: Carol Wilson Site/Location ID: State:
Telephone Number: 319 484 2618 Fax: Report To: Carol Wilson
Sampler Name: (Print Name) Carol Wilson Invoice To:
Sampler Signature: Carol E Wilson Quote #: PO#:

TAT: ✓ Standard; ___ Rush (surcharges may apply)
Date Needed:
Fax Results: Y N

QC Deliverables: ___ None; ___ Level 2 (Batch QC); ___ Level 3; ___ Level 4; Other:

SAMPLE ID	Date Sampled	Time Sampled	G = Grab, C = Composite	Field Filtered	Matrix: SL - Sludge, DW - Drinking Water, GW - Groundwater, S - Soil/Solid, WW - Wastewater, Specify Other	Preservation & # of Containers: HNO_3	HCl	NaOH	H_2SO_4	Methanol	None	Other (Specify)	Analyze For: Total Lead	REMARKS
B-5-L-1	4.26.01	am	G		S						✓		✓	
B-5-L-1D	4.26.01	am	G		S						✓		✓	
S-10-L-1	4.26.01	am	G		S						✓		✓	
C-11-4-1	4.26.01	pm	G		S						✓		✓	
C-11-4-2	4.26.01	pm	G		S						✓		✓	
C-11-4-3	4.26.01	pm	G		S						✓		✓	
C-11-4-4	4.26.01	pm	G		S						✓		✓	
B-2-4-1	4.26.01	pm	G		S						✓		✓	
B-2-4-2	4.26.01	pm	G		S						✓		✓	
B-2-4-3	4.26.01	pm	G		S						✓		✓	

Special Instructions:

LABORATORY COMMENTS:
Init Lab Temp:
Rec Lab Temp:
Custody Seals: Y N N/A
Bottles Supplied by TestAmerica: Y N
Method of Shipment:

Relinquished By: Carol E Wilson	Date: 4/26/01	Time: 4p	Received By: Edna Mueller	Date: 4/27/01	Time: 8:00
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:

TestAmerica INCORPORATED

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613

Phone: 319-277-2401
Fax: 319-277-2425

To assist us in using the proper analytical methods, is this work being conducted for regulatory purposes?
Compliance Monitoring RCRA Closure

Client Name: CHEM-ECO Client #:
Address: P.O. Box 367 Project Name:
City/State/Zip Code: Adamosa IA 52205 Project #: 98-022
Project Manager: Carol Wilson Site/Location ID: State:
Telephone Number: 319 484 2618 Fax: Report To: Carol Wilson
Sampler Name: (Print Name) Carol Wilson Invoice To:
Sampler Signature: Carol E Wilson Quote #: PO#:

TAT
___ Standard
___ Rush (surcharges may apply)
Date Needed: _____
Fax Results: Y N

QC Deliverables
___ None
___ Level 2 (Batch QC)
___ Level 3
___ Level 4
Other: _____

SAMPLE ID	Date Sampled	Time Sampled	G = Grab, C = Composite	Field Filtered	Matrix: SL - Sludge DW - Drinking Water GW - Groundwater S - Soil/Solid WW - Wastewater Specify Other	Preservation & # of Containers: HNO_3	HCl	NaOH	H_2SO_4	Methanol	None	Other (Specify)	Analyze For: Total lead	TCLP metals	REMARKS
B-2-4-4	4/26/01	pm	G		S						✓		✓		
B-2-4-4 D			G		S						✓		✓		
C-11-4			C		S						✓			✓	
B-2-4			C		S						✓			✓	
PD water	↓	↓	G		GW	✓							✓		

Special Instructions:

LABORATORY COMMENTS:
Init Lab Temp:
Rec Lab Temp:
Custody Seals: Y N N/A
Bottles Supplied by TestAmerica: Y N
Method of Shipment:

	Date	Time		Date	Time
Relinquished By: Carol E Wilson	Date: 4/26/01	Time: 4p	Received By: Edna Moulding	Date: 4/27/01	Time: 9:00
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:

Appendix J

Groundwater Analytical Reports
Closure Activities 29 November 2001

TestAmerica
INCORPORATED

ANALYTICAL REPORT

Carol Wilson
CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

12/11/2001

PROJECT #98-022

Date Received: 12/01/2001
Job Number: 01.14459

	Result	Units	Date Taken	Date Analyzed	Time Analyzed	Analyst	Analysis Method
[illegible] TMW-1							
ICP Metals Prep	D	mg/L	11/29/2001	12/05/2001		tdo	
Arsenic, GFAA	0.0039	mg/L	11/29/2001	12/07/2001		llw	SW 7060A
Thallium, GFAA	<0.0005	mg/L	11/29/2001	12/10/2001		llw	SW 7131A
Lead, GFAA	0.0012	mg/L	11/29/2001	12/06/2001		llw	SW 7421
GFAA Total Metals Digestion	D		11/29/2001	12/05/2001		tdo	
ICP Metals - SW-6010B	Complete		11/29/2001	12/06/2001		heh	SW 6010B
Chromium, ICP	<0.020	mg/L	11/29/2001	12/06/2001		heh	SW 6010B
[illegible] TMW-2							
ICP Metals Prep	D	mg/L	11/29/2001	12/05/2001		tdo	
Arsenic, GFAA	<0.0010	mg/L	11/29/2001	12/07/2001		llw	SW 7060A
Thallium, GFAA	<0.0005	mg/L	11/29/2001	12/10/2001		llw	SW 7131A
Lead, GFAA	<0.0040	mg/L	11/29/2001	12/06/2001		llw	SW 7421
GFAA Total Metals Digestion	D		11/29/2001	12/05/2001		tdo	
ICP Metals - SW-6010B	Complete		11/29/2001	12/06/2001		heh	SW 6010B
Chromium, ICP	<0.020	mg/L	11/29/2001	12/06/2001		heh	SW 6010B
661903 TMW-3							
Turbidity	1.3	NTU	11/29/2001	12/04/2001		tdo	EPA 180.1
ICP Metals Prep	D	mg/L	11/29/2001	12/05/2001		tdo	
Arsenic, GFAA	<0.0010	mg/L	11/29/2001	12/07/2001		llw	SW 7060A

Kristin Clay
Kristin M. Clay
Operations Manager
Iowa Lab Certification - 7

TestAmerica
INCORPORATED

ANALYTICAL REPORT

Carol Wilson
CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

12/11/2001

PROJECT #98-022

Date Received: 12/01/2001
Job Number: 01.14459

	Result	Units	Date Taken	Date Analyzed	Time Analyzed	Analyst	Analysis Method
[illegible] TMW-3							
Cadmium, GFAA	<0.0005	mg/L	11/29/2001	12/10/2001		llw	SW 7131A
Lead, GFAA	<0.0040	mg/L	11/29/2001	12/06/2001		llw	SW 7421
GFAA Total Metals Digestion	D		11/29/2001	12/05/2001		tdo	
ICP Metals - SW-6010B	Complete		11/29/2001	12/06/2001		heh	SW 6010B
Chromium, ICP	<0.020	mg/L	11/29/2001	12/06/2001		heh	SW 6010B
[illegible] TMW-3D							
ICP Metals Prep	D	mg/L	11/29/2001	12/05/2001		tdo	
Arsenic, GFAA	<0.0010	mg/L	11/29/2001	12/07/2001		llw	SW 7060A
Cadmium, GFAA	<0.0005	mg/L	11/29/2001	12/10/2001		llw	SW 7131A
Lead, GFAA	<0.0040	mg/L	11/29/2001	12/06/2001		llw	SW 7421
GFAA Total Metals Digestion	D		11/29/2001	12/05/2001		tdo	
ICP Metals - SW-6010B	Complete		11/29/2001	12/06/2001		heh	SW 6010B
Chromium, ICP	<0.020	mg/L	11/29/2001	12/06/2001		heh	SW 6010B
551905 TMW-4							
ICP Metals Prep	D	mg/L	11/29/2001	12/05/2001		tdo	
Arsenic, GFAA	0.0028	mg/L	11/29/2001	12/07/2001		llw	SW 7060A
Cadmium, GFAA	0.0005	mg/L	11/29/2001	12/10/2001		llw	SW 7131A
Lead, GFAA	<0.0040	mg/L	11/29/2001	12/06/2001		llw	SW 7421
GFAA Total Metals Digestion	D		11/29/2001	12/05/2001		tdo	

Kristin Clay
Kristin M. Clay
Operations Manager
Iowa Lab Certification - 7

TestAmerica
INCORPORATED

ANALYTICAL REPORT

Carol Wilson
CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

12/11/2001

PROJECT #98-022

Date Received: 12/01/2001
Job Number: 01.14459

	Result	Units	Date Taken	Date Analyzed	Time Analyzed	Analyst	Analysis Method
[illegible] TMW-4							
ICP Metals SW-6010B	Complete		11/29/2001	12/06/2001		heh	SW 6010B
[illegible], ICP	<0.020	mg/L	11/29/2001	12/06/2001		heh	SW 6010B

Kristin Clay
Kristin M. Clay
Operations Manager
Iowa Lab Certification - 7

Sample Receipt and Temperature Log Form

Client: Chem-Eco Project: _____

City: _____

Date: 12-1-11 Receiver's Initials CH Time (if Applicable): _____

Temperature Record

Cooler #1: 3 ° C / On Ice ☒ Temp. Blank

Cooler #2: _____ ° C / On Ice ☐ Temp. Blank

Cooler #3: _____ ° C / On Ice ☐ Temp. Blank

Cooler #4: _____ ° C / On Ice ☐ Temp. Blank

Couriers

☐ Airborne	☐ Speedy
☐ UPS	☐ TA Courier
☒ Velocity	☐ TA Field Svs
☐ FedEx	☐ Client
☐ DHL	
☐ US Postal	☐ Other

Thermometer:

☐ IR-905085 ☐ CF07-03-T1

☒ IR-809065 ☐ CF07-03-T2

☐ Samples Not Received in a Cooler

☐ Temperature Not Taken

☐ Samples Received Within 6 hrs of sampling

COC Completed Correctly? ☒ Yes ☐ No
(Cite inconsistencies below)

Custody Seals Intact? ☐ Yes ☐ No
(If Applicable)

Cooler Checklist (Check indicates conformance failure)

	Received Broken		Improper Container		Temperature*
	Improperly Preserved		Missing Sample		Extra Sample
	Missing Label		Sample Past Hold Date		Improper Label
	Insufficient Sample Volume		Other:		

Client Sample IDs: **Remarks/Action Taken:** **Initial/Date:**

*Refer to SOP CF01-01 for Temperature Criteria

TestAmerica
INCORPORATED

QUALITY CONTROL REPORT
BLANKS

CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

11/01/2000

Carol Wilson

Job Number: 00.13418

Analyte	Prep Batch Number	Run Batch Number	Blank Analysis	Units	Date Analyzed	Analyst
Lead		353	<0.10	mg/L	10/31/2000	llw
Lead, ICP	926	1150	<0.10	mg/L	10/24/2000	llw

NA - Not Applicable

Advisory Control Limits for Blanks:
Metals/Wet Chemistry/ Conventionals/GC - all compounds should be less than the Reporting Limit.
GC/MS - Semi-Volatiles - all compounds should be less than the Reporting Limit except for phthalates which should be less than 5 times the reporting limit.
Volatiles - Toluene, methylene chloride, acetone and chloroform should be less than 5 times the Reporting Limit. All other volatile compounds should be less than the Reporting Limit.

TestAmerica
INCORPORATED

QUALITY CONTROL REPORT
MATRIX SPIKE/MATRIX SPIKE DUPLICATE

CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

11/01/2000

Carol Wilson

Job Number: 00.13418

Analyte	Prep Batch Number	Run Batch Number	Analysis Result	Units	MS Result	MS % Recovery	MSD Result	MSD % Recovery	MS/MSD RPD
Lead		353	56	mg/kg	248	98.5	262	105.6	5.5
ICP Metals-Solid		1117	Complete	mg/kg					
Lead, ICP	926	1150	170	mg/kg	492	163.5	306	69.0	46.6

NOTE: Matrix Spike Samples may not be samples from this job.

NA = Not Applicable
MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference

TestAmerica
INCORPORATED

QUALITY CONTROL REPORT
STANDARDS

CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

11/01/2000

Carol Wilson

Job Number: 00.13418

Analyte	Prep Batch Number	Run Batch Number	CCV % Recovery	LCS % Recovery	Analyst
Lead		353	103.6	105.0	llw
Lead		353	103.8		
ICP Metals-Solid		1117	100.0		
Lead, ICP	926	1150	98.2	94.0	llw
Lead, ICP		1150	98.2		

CCV - Continuing Calibration Verification
LCS - Laboratory Control Standard
NA - Not Applicable

TestAmerica INCORPORATED

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613

Phone: 319-277-2401
Fax: 319-277-2425

To assist us in using the proper analytical methods, is this work being conducted for regulatory purposes?
Compliance Monitoring RCRA Closure

Client Name: CHEM-ECO Client #:
Address: P.O. Box 367 Project Name:
City/State/Zip Code: Ainsworth IA 52205 Project #: 96005
Project Manager: Carol Wilson Site/Location ID: State:
Telephone Number: 319 464 2615 Fax: 2930 Report To: Carol Wilson
Sampler Name: (Print Name) Carol Wilson Invoice To: [illegible]
Sampler Signature: Carol Wilson Quote #: PO#:

TAT: ✓ Standard; ___ Rush (surcharges may apply)
Date Needed:
Fax Results: Y N

QC Deliverables: ___ None; ___ Level 2 (Batch QC); ___ Level 3; ___ Level 4; Other:

SAMPLE ID	Date Sampled	Time Sampled	Matrix: G = Grab, C = Composite	Field Filtered	Matrix: SL - Sludge DW - Drinking Water GW - Groundwater S - Soil/Solid WW - Wastewater Specify Other	Preservation & # of Containers: HNO_3	HCl	NaOH	H_2SO_4	Methanol	None	Other (Specify)	Analyze For: Arsenic	Cadmium	Chromium	Lead	Turbidity						REMARKS
TAHW-1	11/29/01	2pm	G	n	GW	X							✓	✓	✓	✓							
TAHW-2			C	n		X							✓	✓	✓	✓							
TAHW-3			C	n		X					X		✓	✓	✓	✓	✓						
TAHW-3D			C	n		X							✓	✓	✓	✓							
TAHW-4	↓	↓	C	n	↓	X							✓	✓	✓	✓							

Special Instructions:
Must meet following detection limits: Arsenic 0.05 mg/L Cadmium 0.01 mg/L Chromium 0.05 mg/L Lead 0.05 mg/L

Relinquished By	Date	Time	Received By	Date	Time
[signature]	11/30/01	4:30			
			[signature]	12/1/01	8:00

LABORATORY COMMENTS:
Init Lab Temp:
Rec Lab Temp:
Custody Seals: Y N N/A
Bottles Supplied by TestAmerica: Y N
Method of Shipment:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VII
901 NORTH 5TH STREET
KANSAS CITY, KANSAS 66101

March 6, 2002

Dr. John Tyrrell
Hawkeye Castings, Inc./Tyrrell Investments, Inc.
410 North Franklin
Manchester, Iowa 52057

Dear Dr. Tyrrell:

RE: Transmittal of Split Sample Results
Hawkeye Castings, Inc./ a/k/a Tyrrell Investments, Inc.
Manchester, Iowa
EPA RCRA ID No. IAD984599589
Docket No. VII-97-H-0008

Please find enclosed, the analytical results of split groundwater samples collected at the above mentioned facility in November 2001. These split samples were analyzed by the U.S. Environmental Protection Agency (EPA) Region 7 laboratory. Transmittal of these results was delayed because the EPA project manager requested reanalysis of the original samples for lead using a more sensitive method. If you have any questions concerning this letter, please contact me at (913) 551-7657.

Sincerely,

Mary Grisolano, P.E.
Project Manager
RCRA Corrective Action and Permits Branch

cc: Carol Wilson
Chemeco

ASR Number: 1331

Summary of Activity Information

12/21/2001

Activity Leader: Grisolano, Mary **Org:** ARTD/RCAP **Phone:** (913) 551-7657

Activity Number: MLG03

Activity Desc: Hawkeye Castings

Location: Hawkeye **State:** Iowa **Type:** RCRA

Purpose: Compliance monitoring

Explanation of Codes, Units and Qualifiers used on this report.

Sample QC Codes: QC Codes identify the type of sample for quality control purposes.

__ = Field Sample

FD = Field Duplicate __

Units: Specific units in which results are reported.

ug/L = Micrograms per Liter

Data Qualifiers: Specific codes used in conjunction with data values to provide additional information on the quality of reported results, or used to explain the absence of a specific value.

(Blank) = Values have been reviewed and found acceptable for use.

U = Not detected at or above the reportable level shown.

Activity Number: MLG03 **ASR Number:** 1331 **Sample Information Summary**

Activity Desc: Hawkeye Castings **12/21/2001**

Sample Number	QC Code	Matrix	Location	External Sample No.	Start Date	Start Time	End Date	End Time	Receipt Date
1	- __	Water	Hawkeye Castings - Monitoring well #4 sample		11/29/2001	11:55	11/29/2001	12:40	12/04/2001
1	- FD	Water	Hawkeye Castings - Monitoring well #4/Field Duplicate of sample 1		11/29/2001	11:55	11/29/2001	12:40	12/04/2001
2	- __	Water	Hawkeye Castings - Monitoring well #3 sample		11/29/2001	13:00			12/04/2001

Activity Number: MLG03 ASR Number: 1331 RLAB Approved Analysis Comments
Activity Desc: Hawkeye Castings 12/21/2001

Analysis Comments About Results For This Analysis

Activity Number: MLG03 ASR Number: 1331 RLAB Approved Sample Analysis Results
Activity Desc: Hawkeye Castings 12/21/2001

Analysis / Analyte	Units	1-__	1-FD	2-__
Arsenic in Water by AA				
Arsenic	ug/L	2.29	2.41	2.00 U
Lead in Water by AA				
Lead	ug/L	1.00 U	1.27	1.61
Mercury in Water				
Mercury	ug/L	0.200 U	0.200 U	0.200 U
Selenium in Water by AA				
Selenium	ug/l	2.00 U	2.00 U	2.00 U
Total Metals Analysis of TCLP Metals in Water by ICAP				
Barium	ug/L	69.2	69.6	91.9
Cadmium	ug/L	7.31	3.00 U	3.00 U
Chromium	ug/L	15.0 U	15.0 U	15.0 U
Lead	ug/L	100 U	100 U	100 U
Silver	ug/L	25.0 U	25.0 U	25.0 U

CHAIN OF CUSTODY RECORD
ENVIRONMENTAL PROTECTION AGENCY REGION VII

ACTIVITY LEADER(Print)	NAME OF SURVEY OR ACTIVITY		DATE OF COLLECTION	SHEET
GRISWOLD	HAWKEYE CASTINGS ASR 1331	MLG 03	11 (DAY) 29 (MONTH) 01 (YEAR)	1 of 1

CONTENTS OF SHIPMENT

SAMPLE NUMBER	CUBITAINER ✓	BOTTLE	BOTTLE	BOTTLE	VOA SET (2 VIALS EA)	water	soil	sediment	dust	other	RECEIVING LABORATORY REMARKS OTHER INFORMATION (condition of samples upon receipt other sample numbers etc.)
	NUMBERS OF CONTAINERS PER SAMPLE NUMBER										
1331-1	1					✓					
1331-~~1D~~	~~1D~~ 1					✓					
						✓					
1331-2	1										
											Clr. Temp. Rec'd bet. 3-5°C

Complete

DESCRIPTION OF SHIPMENT	MODE OF SHIPMENT
____ PIECE(S) CONSISTING OF ____ BOX(ES)	✓ COMMERCIAL CARRIER: Fed-Ex
1 ICE CHEST(S); OTHER ____	____ COURIER
	____ SAMPLER CONVEYED 827438693809 (SHIPPING DOCUMENT NUMBER)

PERSONNEL CUSTODY RECORD 12/4/01

RELINQUISHED BY (SAMPLER)	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
[signature] ☑ SEALED ☐ UNSEALED	12/3/01	11:00	Nicole Roblez KCA ☑ SEALED ☐ UNSEALED	Analyze
RELINQUISHED BY ☐ SEALED ☐ UNSEALED	DATE	TIME	RECEIVED BY ☐ SEALED ☐ UNSEALED	REASON FOR CHANGE OF CUSTODY
RELINQUISHED BY ☐ SEALED ☐ UNSEALED	DATE	TIME	RECEIVED BY ☐ SEALED ☐ UNSEALED	REASON FOR CHANGE OF CUSTODY

Sample Collection Field Sheet

US EPA Region VII
Kansas City, KS

ASR Number: 1331 Sample Number: 1 QC Code: __ Matrix: Water Tag ID: 1331-1

Activity Number: MLG03 Activity Leader: Grisolano, Mary
Activity Desc: Hawkeye Castings
Location: Hawkeye State: Iowa Type: RCRA

Location Desc: Hawkeye Castings - Monitoring Well # 4
STORET ID: ____________ External Sample Number: ____________
Expected Conc: Circle One: Low Medium High

			Date	Time (24 Hr)
Latitude: 42° 28.247'	Sample Collection:	Start	11/29/01	11:55
Longitude: 91° 27.680'		End	__/__/__	12:40

Took 45 minutes to obtain sample

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 Liter Cubitainer	5 mL of HNO3/L to pH<2	180 Days	Mercury in Water
1 - 1 Liter Cubitainer	HNO3 acidify, 4 Deg C	180 Days	Total Metals Analysis of TCLP Metals in Water by ICAP
1 - 1 Liter Cubitainer	HNO3 acidify, 4 Deg C	180 Days	Arsenic in Water by AA
			Selenium in Water by AA

can combine 1 full liter cubi.

Sample Comments:

Used low volume peristaltic pump set at Lowest flow rate to obtain sample took 45 minutes to collect sample + Duplicate. Sample had low turbidity

J Caldwell

Sample collected by: J. Caldwell

Sample Collection Field Sheet

US EPA Region VII
Kansas City, KS

Duplicate Sample

ASR Number: 1331 Sample Number: 1-10 QC Code: FD Matrix: Water Tag ID: 1331-10

Activity Number: MLG03 Activity Leader: Grisolano, Mary
Activity Desc: Hawkeye Castings
Location: Hawkeye State: Iowa Type: RCRA

Location Desc: Monitoring Well # 4 - Hawkeye Castings Duplicate Sample

STORET ID: _____ External Sample Number: _____

Expected Conc: Circle One: Low Medium High

Latitude: 42° 28.247' Sample Collection: Start 11/29/01 11:55 } took 45 minutes to obtain sample + duplicate
Longitude: 91° 27.680' End __/__/__ 12:40

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 Liter Cubitainer	5 mL of HNO3/L to pH < 2	180 Days	Mercury in Water
1 - 1 Liter Cubitainer	HNO3 acidify, 4 Deg C	180 Days	Total Metals Analysis of TCLP Metals in Water by ICAP
1 - 1 Liter Cubitainer	HNO3 acidify, 4 Deg C	180 Days	Arsenic in Water by AA Selenium in Water by AA

combine in 1 full liter cubi

Sample Comments:

Duplicate Sample for MW # 4

Sample collected by: J. Caldwell

Sample Collection Field Sheet

US EPA Region VII
Kansas City, KS

ASR Number: 1331 Sample Number: 2 QC Code: __ Matrix: Water Tag ID: 1331-2__

Activity Number: MLG03 Activity Leader: Grisolano, Mary
Activity Desc: Hawkeye Castings
Location: Hawkeye State: Iowa Type: RCRA

Location Desc: HAWKEYE CASTINGS - Mon. Well # 3
STORET ID: _____ External Sample Number: _____
Expected Conc: Circle One: Low Medium High

			Date	Time (24 Hr)
Latitude:	42° :28.262'	Sample Collection: Start	11/29/01	13 00
Longitude:	91° :27.656'	End	__/__/__	__:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 Liter Cubitainer	5 mL of HNO3/L to pH < 2	180 Days	Mercury in Water
1 - 1 Liter Cubitainer	HNO3 acidify, 4 Deg C	180 Days	Total Metals Analysis of TCLP Metals in Water by ICAP
1 - 1 Liter Cubitainer	HNO3 acidify, 4 Deg C	180 Days	Arsenic in Water by AA
			Selenium in Water by AA

Can combine in 1 full liter cubitainer.

Sample Comments:

Used Low flow volume peristaltic pump to obtain GW Sample. Did not purge well before sampling. Well had low recharge rate - pump set on lowest flow volume during sampling. Sample had minimal turbidity.

Caldwell

Sample collected by: J. Caldwell

Appendix K

Groundwater Analytical Reports
Closure Activities 30 April 2002

TestAmerica
INCORPORATED

ANALYTICAL REPORT

Carol Wilson
CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

05/14/2002

Date Received: 05/01/2002
Job Number: 02.05107

	Result	Units	Flags	Date Taken	Date Analyzed	Time Analyzed	Analyst	Analysis Method
673635 TMW-1 Project #98-022								
Turbidity	7.9	NTU		04/30/2002	05/01/2002		tdo	EPA 180.1
ICP Metals Prep	D	mg/L		04/30/2002	05/01/2002		mrm	
Arsenic, GFAA	0.0015	mg/L		04/30/2002	05/13/2002		lmc	SW 7060A
Cadmium, GFAA	<0.0005	mg/L		04/30/2002	05/06/2002		lmc	SW 7131A
Lead, GFAA	0.0043	mg/L		04/30/2002	05/07/2002		lmc	SW 7421
GFAA Total Metals Digestion	D			04/30/2002	05/02/2002		tdo	
ICP Metals - SW-6010B	Complete	mg/L		04/30/2002	05/02/2002		llw	SW 6010B
Chromium, ICP	<0.020	mg/L		04/30/2002	05/02/2002		llw	SW 6010B
673636 TMW-2 Project #98-022								
Turbidity	5.5	NTU		04/30/2002	05/01/2002		tdo	EPA 180.1
ICP Metals Prep	D	mg/L		04/30/2002	05/01/2002		mrm	
Arsenic, GFAA	<0.0010	mg/L		04/30/2002	05/13/2002		lmc	SW 7060A
Cadmium, GFAA	<0.0005	mg/L		04/30/2002	05/06/2002		lmc	SW 7131A
Lead, GFAA	<0.0040	mg/L		04/30/2002	05/07/2002		lmc	SW 7421
GFAA Total Metals Digestion	D			04/30/2002	05/02/2002		tdo	
ICP Metals - SW-6010B	Complete	mg/L		04/30/2002	05/02/2002		llw	SW 6010B

Key to Flags:

Kristin M. Clay
Operations Manager
Iowa Lab Certification - 7

ANALYTICAL REPORT

Carol Wilson
CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

05/14/2002

Date Received: 05/01/2002
Job Number: 02.05107

	Result	Units	Flags	Date Taken	Date Analyzed	Time Analyzed	Analyst	Analysis Method
673636 TMW-2 Project #98-022								
Chromium, ICP	<0.020	mg/L		04/30/2002	05/02/2002		llw	SW 6010B
673637 TMW-3 Project #98-022								
Turbidity	1.6	NTU		04/30/2002	05/01/2002		tdo	EPA 180.1
ICP Metals Prep	D	mg/L		04/30/2002	05/01/2002		mrm	
Arsenic, GFAA	<0.0010	mg/L		04/30/2002	05/13/2002		lmc	SW 7060A
Cadmium, GFAA	<0.0005	mg/L		04/30/2002	05/06/2002		lmc	SW 7131A
Lead, GFAA	<0.0040	mg/L		04/30/2002	05/07/2002		lmc	SW 7421
GFAA Total Metals Digestion	D			04/30/2002	05/02/2002		tdo	
ICP Metals - SW-6010B	Complete	mg/L		04/30/2002	05/02/2002		llw	SW 6010B
Chromium, ICP	<0.020	mg/L		04/30/2002	05/02/2002		llw	SW 6010B
673638 TMW-3D Project #98-022								
Turbidity	1.0	NTU		04/30/2002	05/01/2002		tdo	EPA 180.1
ICP Metals Prep	D	mg/L		04/30/2002	05/01/2002		mrm	
Arsenic, GFAA	<0.0010	mg/L		04/30/2002	05/13/2002		lmc	SW 7060A

Key to Flags:

Kristin M. Clay
Operations Manager
Iowa Lab Certification - 7

ANALYTICAL REPORT

Carol Wilson
CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

05/14/2002

Date Received: 05/01/2002
Job Number: 02.05107

	Result	Units	Flags	Date Taken	Date Analyzed	Time Analyzed	Analyst	Analysis Method
673638 TMW-3D Project #98-022								
Cadmium, GFAA	<0.0005	mg/L		04/30/2002	05/06/2002		lmc	SW 7131A
Lead, GFAA	<0.0040	mg/L		04/30/2002	05/07/2002		lmc	SW 7421
GFAA Total Metals Digestion	D			04/30/2002	05/02/2002		tdo	
ICP Metals - SW-6010B	Complete	mg/L		04/30/2002	05/02/2002		llw	SW 6010B
Chromium, ICP	<0.020	mg/L		04/30/2002	05/02/2002		llw	SW 6010B
673639 TMW-4 Project #98-022								
Turbidity	15.0	NTU		04/30/2002	05/01/2002		tdo	EPA 180.1
ICP Metals Prep	D	mg/L		04/30/2002	05/01/2002		mrm	
Arsenic, GFAA	0.0030	mg/L		04/30/2002	05/13/2002		lmc	SW 7060A
Cadmium, GFAA	<0.0005	mg/L		04/30/2002	05/06/2002		lmc	SW 7131A
Lead, GFAA	<0.0040	mg/L		04/30/2002	05/07/2002		lmc	SW 7421
GFAA Total Metals Digestion	D			04/30/2002	05/02/2002		tdo	
ICP Metals - SW-6010B	Complete	mg/L		04/30/2002	05/02/2002		llw	SW 6010B
Chromium, ICP	<0.020	mg/L		04/30/2002	05/02/2002		llw	SW 6010B

Key to Flags:

Kristin M. Clay
Operations Manager
Iowa Lab Certification - 7

TestAmerica Job Number: 02.05107

ATTACHMENTS

Following are the sample receipt log and the chain of custody applicable to this analytical report.

For questions regarding this report, please contact the individual who signed the analytical report.

TestAmerica INCORPORATED

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613

Phone: 319-277-2401
Fax: 319-277-2425

To assist us in using the proper analytical methods, is this work being conducted for regulatory purposes?
Compliance Monitoring RCRA

Client Name: CHEM-ECO Client #: 98-022
Address: P.O. Box 367
City/State/Zip Code: Anamosa IA 52205
Project Manager: Carol Wilson
Telephone Number: 319-464-2616 Fax: 319-464-2930
Sampler Name: (Print Name) Carol Wilson
Sampler Signature: Carol E Wilson

Project Name: 98-022
Project #:
Site/Location ID: State:
Report To: Carol Wilson
Invoice To: Prepaid
Quote #: 02.0178 PO#:

TAT
✓ Standard
___ Rush (surcharges may apply)
Date Needed:
Fax Results: (Y) N

QC Deliverables
___ None
___ Level 2 *(Batch QC)*
___ Level 3
___ Level 4
Other: ___

SAMPLE ID	Date Sampled	Time Sampled	G = Grab, C = Composite	Field Filtered	Matrix: SL - Sludge DW - Drinking Water GW - Groundwater S - Soil/Solid WW - Wastewater Specify Other	Preservation & # of Containers: HNO_3	HCl	NaOH	H_2SO_4	Methanol	None	Other (Specify)	Analyze For: Total arsenic, cad cadmium chromium	Turbidity	REMARKS
TMW-1	4/3/02	9:30am	G		GW	✓					✓		✓	✓	
TMW-2		10:45am	G		GW	✓					✓		✓	✓	
TMW-3		11:00am	G		GW	✓					✓		✓	✓	
TMW-3D		11:15am	G		GW	✓					✓		✓	✓	
TMW-4	↓	10:30am	G		GW	✓					✓		✓	✓	

Special Instructions:
Detection limits: As 0.05 mg/L Cd 0.01 mg/L Cr 0.05 mg/L Pb 0.05 mg/L
Turbidity = 50

LABORATORY COMMENTS:
Init Lab Temp:
Rec Lab Temp:
Custody Seals: Y N N/A
Bottles Supplied by TestAmerica: Y N
Method of Shipment:

Relinquished By: Carol E Wilson	Date: 4/3/02	Time: 5 pm	Received By: Edna M Fuelling	Date: 5/6/02	Time: 8:00
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:

Appendix L

Groundwater Analytical Reports
Closure Activities 12 September 2002

TestAmerica
INCORPORATED

ANALYTICAL REPORT

Carol Wilson
CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

09/24/2002

Date Received: 09/13/2002
Job Number: 02.11471

	Result	Units	Date Taken	Date Analyzed	Time Analyzed	Analyst	Analysis Method
696256 TMW-1 Project #98-022							
Turbidity	35.5	NTU	09/12/2002	09/13/2002		tdo	EPA 180.1
ICP Metals Prep	D	mg/L	09/12/2002	09/16/2002		tdo	
Arsenic, GFAA	0.0040	mg/L	09/12/2002	09/23/2002		llw	SW 7060A
Cadmium, GFAA	<0.0005	mg/L	09/12/2002	09/19/2002		llw	SW 7131A
Lead, GFAA	0.0088	mg/L	09/12/2002	09/17/2002		mrm	SW 7421
GFAA Total Metals Digestion	D		09/12/2002	09/17/2002		tdo	
ICP Metals - SW-6010B	Complete	mg/L	09/12/2002	09/17/2002		heh	SW 6010B
Chromium, ICP	<0.020	mg/L	09/12/2002	09/17/2002		heh	SW 6010B
696257 TMW-2 Project #98-022							
Turbidity	1.5	NTU	09/12/2002	09/13/2002		tdo	EPA 180.1
ICP Metals Prep	D	mg/L	09/12/2002	09/16/2002		tdo	
Arsenic, GFAA	<0.0010	mg/L	09/12/2002	09/23/2002		llw	SW 7060A
Cadmium, GFAA	<0.0005	mg/L	09/12/2002	09/19/2002		llw	SW 7131A
Lead, GFAA	<0.0040	mg/L	09/12/2002	09/17/2002		mrm	SW 7421
GFAA Total Metals Digestion	D		09/12/2002	09/17/2002		tdo	
ICP Metals - SW-6010B	Complete	mg/L	09/12/2002	09/17/2002		heh	SW 6010B
Chromium, ICP	<0.020	mg/L	09/12/2002	09/17/2002		heh	SW 6010B
696258 TMW-3 Project #98-022							
Turbidity	3.3	NTU	09/12/2002	09/13/2002		tdo	EPA 180.1
ICP Metals Prep	D	mg/L	09/12/2002	09/16/2002		tdo	
Arsenic, GFAA	<0.0010	mg/L	09/12/2002	09/23/2002		llw	SW 7060A
Cadmium, GFAA	<0.0005	mg/L	09/12/2002	09/19/2002		llw	SW 7131A
Lead, GFAA	<0.0040	mg/L	09/12/2002	09/17/2002		mrm	SW 7421

Kristin M. Clay
Operations Manager
Iowa Lab Certification - 7

TestAmerica INCORPORATED

ANALYTICAL REPORT

Carol Wilson
CHEM-ECO ENGINEERS, INC.
P.O. Box 367
Anamosa, IA 52205

09/24/2002

Date Received: 09/13/2002
Job Number: 02.11471

	Result	Units	Date Taken	Date Analyzed	Time Analyzed	Analyst	Analysis Method
696258 TMW-3 Project #98-022							
GFAA Total Metals Digestion	D		09/12/2002	09/17/2002		tdo	
ICP Metals - SW-6010B	Complete	mg/L	09/12/2002	09/17/2002		heh	SW 6010B
Chromium, ICP	<0.020	mg/L	09/12/2002	09/17/2002		heh	SW 6010B
696259 TMW-3D Project #98-022							
Turbidity	3.1	NTU	09/12/2002	09/13/2002		tdo	EPA 180.1
ICP Metals Prep	D	mg/L	09/12/2002	09/16/2002		tdo	
Arsenic, GFAA	<0.0010	mg/L	09/12/2002	09/23/2002		llw	SW 7060A
Cadmium, GFAA	<0.0005	mg/L	09/12/2002	09/19/2002		llw	SW 7131A
Lead, GFAA	<0.0040	mg/L	09/12/2002	09/17/2002		mrm	SW 7421
GFAA Total Metals Digestion	D		09/12/2002	09/17/2002		tdo	
ICP Metals - SW-6010B	Complete	mg/L	09/12/2002	09/17/2002		heh	SW 6010B
Chromium, ICP	<0.020	mg/L	09/12/2002	09/17/2002		heh	SW 6010B
696260 TMW-4 Project #98-022							
Turbidity	15.4	NTU	09/12/2002	09/13/2002		tdo	EPA 180.1
ICP Metals Prep	D	mg/L	09/12/2002	09/16/2002		tdo	
Arsenic, GFAA	0.0030	mg/L	09/12/2002	09/23/2002		llw	SW 7060A
Cadmium, GFAA	<0.0005	mg/L	09/12/2002	09/19/2002		llw	SW 7131A
Lead, GFAA	<0.0040	mg/L	09/12/2002	09/17/2002		mrm	SW 7421
GFAA Total Metals Digestion	D		09/12/2002	09/17/2002		tdo	
ICP Metals - SW-6010B	Complete	mg/L	09/12/2002	09/17/2002		heh	SW 6010B
Chromium, ICP	<0.020	mg/L	09/12/2002	09/17/2002		heh	SW 6010B

Linda Cruelle for KMC
Kristin M. Clay
Operations Manager
Iowa Lab Certification - 7

TestAmerica Job Number: 02.11471

ATTACHMENTS

Following are the sample receipt log and the chain of custody applicable to this analytical report.

For questions regarding this report, please contact the individual who signed the analytical report.

TestAmerica INCORPORATED

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613

Phone 319-277-2401 or 800-750-2401
Fax 319-277-2425

To assist us in using the proper analytical methods, is this work being conducted for regulatory purposes?
Compliance Monitoring RCRA Closure

Client Name: CHEM-ECO Client #:
Address: P.O. Box 367 Project Name:
City/State/Zip Code: Anamosa IA 52205 Project #: 98-022
Project Manager: Carol Wilson Site/Location ID: State:
Telephone Number: 319 484 2618 Fax: 319 484-2930 Report To: Carol Wilson
Sampler Name: (Print Name) Carol Wilson Invoice To: CHEM-ECO
Sampler Signature: Carol E Wilson Quote #: PO#:

TAT
✓ Standard
___ Rush (surcharges may apply)
Date Needed:
Fax Results: Y N

Matrix: SL - Sludge, DW - Drinking Water, GW - Groundwater, S - Soil/Solid, WW - Wastewater, Specify Other
Preservation & # of Containers: HNO_3, HCl, NaOH, H_2SO_4, Methanol, None, Other (Specify)
Analyze For: Turbidity, Arsenic (Total), Cadmium (Total), Chromium (Total), Lead (Total)

QC Deliverables
___ None
___ Level 2 (Batch QC)
___ Level 3
___ Level 4
Other:

SAMPLE ID	Date Sampled	Time Sampled	G = Grab, C = Composite	Field Filtered	Matrix	HNO_3	HCl	NaOH	H_2SO_4	Methanol	None	Other	Turbidity	Arsenic (Total)	Cadmium (Total)	Chromium (Total)	Lead (Total)	REMARKS
TMW-1	9/12/02	2pm	G		GW	✓					✓		✓	✓	✓	✓	✓	
TMW-2						✓					✓		✓	✓	✓	✓	✓	
TMW-3						✓					✓		✓	✓	✓	✓	✓	
TMW-3D						✓					✓		✓	✓	✓	✓	✓	
TMW-4						✓					✓		✓	✓	✓	✓	✓	

Special Instructions:
* Standards will be faxed to you for detection limits

Relinquished By: Carol E Wilson	Date: 9/12/02	Time: 1pm	Received By: Edna Muehling	Date: 9-13-02	Time: 8:00
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:

LABORATORY COMMENTS:
Init Lab Temp:
Rec Lab Temp:
Custody Seals: Y N N/A
Bottles Supplied by Test America: Y N
Method of Shipment:

Appendix M

Fill Soil/Purge & Development Water Analytical Report
Closure Activities 19 December 2002

TestAmerica
INCORPORATED

ANALYTICAL REPORT

Carol Wilson
CHEM-ECO Engineers, Inc.
P.O. Box 367
Anamosa, IA 52205

12/30/2002

PROJECT #98-022

Date Received: 12/20/2002
Job Number: 02.13849

	Result	Units	Date Taken	Date Analyzed	Time Analyzed	Analyst	Analysis Method
301428 Fill Soil Composite							
Solid pH Measured in Water	7.8	units	12/19/2002	12/26/2002		clb	SW 9045
Solids, Total	92.88	%	12/19/2002	12/26/2002		clb	SM 2540 G
TCLP Mercury	<0.0020	mg/L	12/19/2002	12/27/2002		jcp	SW 7470
ICP TCLP Metals	Complete		12/19/2002	12/26/2002		clb	
TCLP Arsenic (ICP)	<0.015	mg/L	12/19/2003	12/27/2002		tlw	SW 6010 B
TCLP Barium (ICP)	0.189	mg/L	12/19/2002	12/27/2002		tlw	SW 6010 B
TCLP Cadmium (ICP)	<0.020	mg/L	12/19/2002	12/27/2002		tlw	SW 6010 B
TCLP Chromium (ICP)	<0.020	mg/L	12/19/2002	12/27/2002		tlw	SW 6010 B
TCLP Lead (ICP)	<0.10	mg/L	12/19/2002	12/27/2002		tlw	SW 6010 B
TCLP Selenium (ICP)	<0.15	mg/L	12/19/2002	12/27/2002		tlw	SW 6010 B
TCLP Silver (ICP)	<0.020	mg/L	12/19/2002	12/27/2002		tlw	SW 6010 B
301429 PD Water - 2							
Mercury, Cold Vapor	<0.00020	mg/L	12/19/2002	12/27/2002		jcp	EPA 245.1
ICP Metals - SW-6010B	Complete		12/19/2002	12/26/2002		clb	
Arsenic, ICP	<0.080	mg/L	12/19/2003	12/27/2002		tlw	SW 6010 B
Barium, ICP	0.377	mg/L	12/19/2002	12/27/2002		tlw	SW 6010 B
Cadmium, ICP	<0.020	mg/L	12/19/2002	12/27/2002		tlw	SW 6010 B
Chromium, ICP	0.008	mg/L	12/19/2002	12/27/2002		tlw	SW 6010 B
Lead, ICP	<0.10	mg/L	12/19/2002	12/27/2002		tlw	SW 6010 B
Selenium, ICP	<0.15	mg/L	12/19/2002	12/27/2002		tlw	SW 6010 B
Silver, ICP	<0.020	mg/L	12/19/2002	12/27/2002		tlw	SW 6010 B

Kristin M. Clay
Operations Manager
Iowa Lab Certification - 7

TestAmerica INCORPORATED

[redacted] Cedar Falls [redacted]on
704 Enterprise Drive
Cedar Falls, IA 50613

[redacted]e: 31[redacted]7 - 2[redacted]or 1[redacted] - 75[redacted]01
Fax: 319 - 277 - 2425

Company: _____ Your PO #: _____

Send Report To: _____ Invoice To: _____

Address: _____ TA Quote #: _____

City/State/Zip Code: _____ Project Name: _____

Telephone Number: _____ Fax: _____ Project Number: _____

Sampled by: (Print Name) _____ Project Manager: _____

(Signature) _____ Proj. Mgr. Telephone: _____

Sample ID	Date Sampled	Time Sampled	# of containers shipped	Grab	Composite	Field Filtered	Preservative: Ice	HNO_3 (Red & White Label)	HCl (Blue & White Label)	NaOH (Orange & White Label)	H_2SO_4 Plastic (Yellow & White Label)	H_2SO_4 Glass(Yellow & White Label)	None (Black & White Label)	Other (Specify)	Matrix: Groundwater	Wastewater	Drinking Water	Sludge	Soil	Other Specify:	Analyze For:										RUSH TAT (Must call ahead!)	Standard TAT	Fax Results	Send QC with report
[illegible]					✓																												
[illegible]																																	

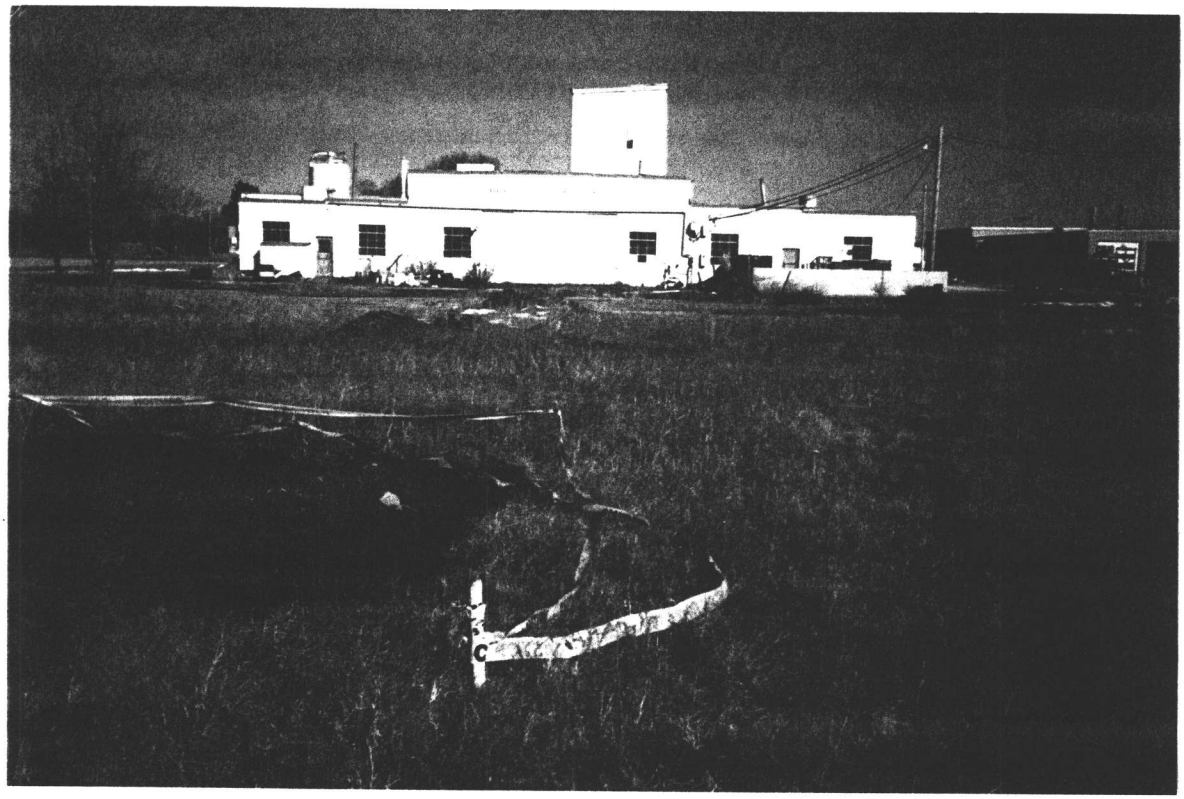
NOTE: All turn around times are calculated from the time of receipt at TestAmerica.
NOTICE: **Pre-Arrangements must be made *AT LEAST 48 Hours in ADVANCE* to receive results with RUSH turn around time commitments; *additional charges* may be assessed.**
NOTE: There may be a charge assessed for TestAmerica disposing of sample remainders.

NOTES:

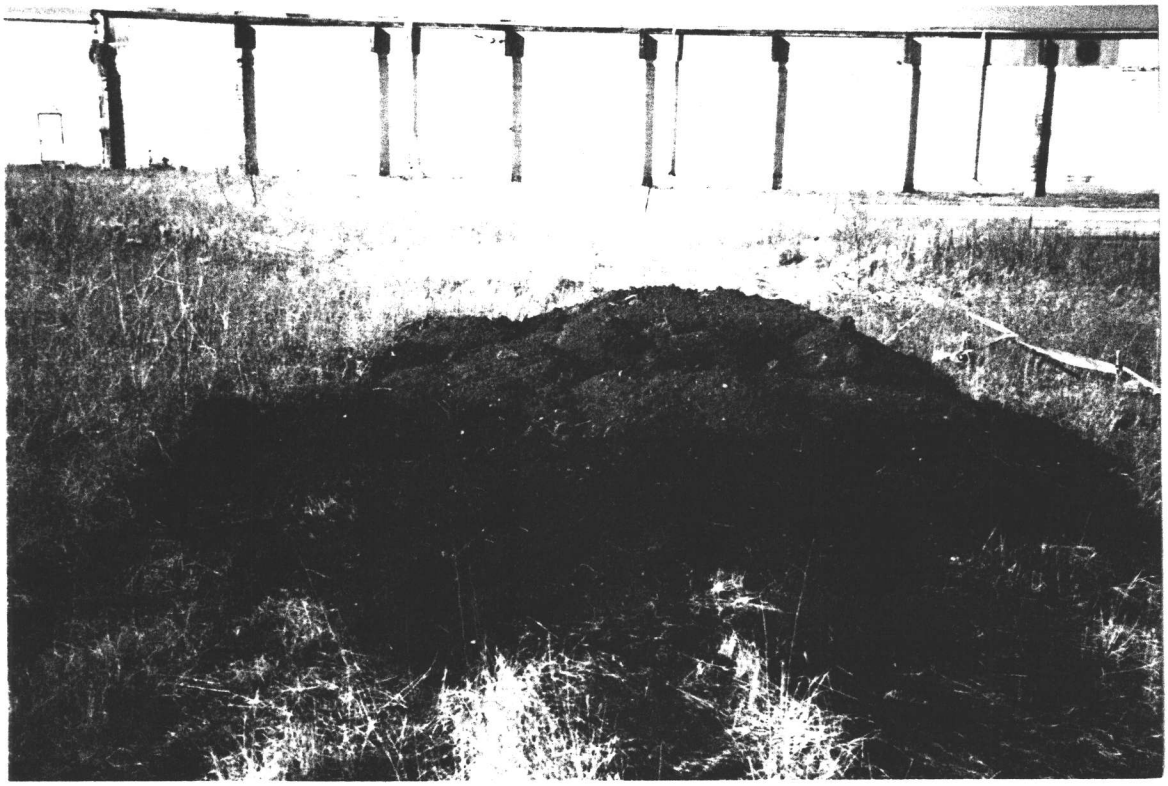
Relinquished by:	Date	Time	Received by:	Date	Time	Relinquished by:	Date	Time
Shipped Via:			Comments:			Shipped Via:		
Received for TestAmerica by:	Date	Time	Temperature Upon Receipt:			Laboratory Comments:		

Appendix N

Site Photographs



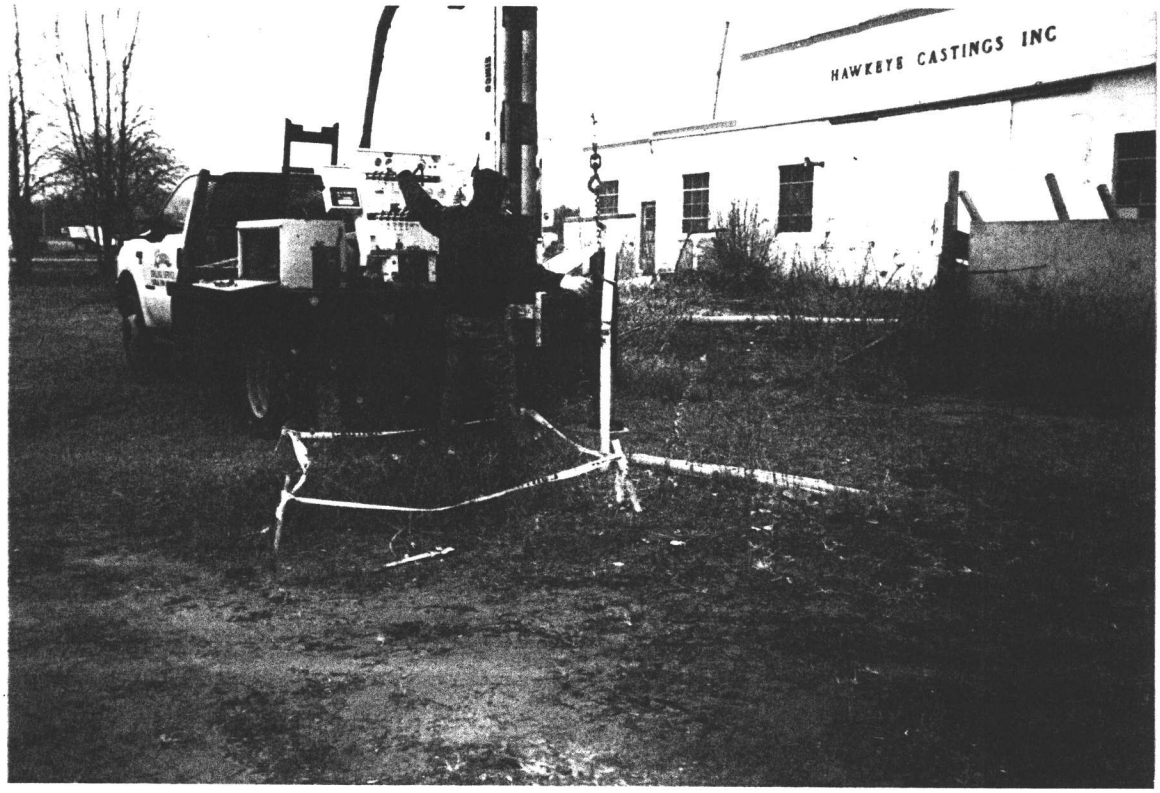
Site view facing east.



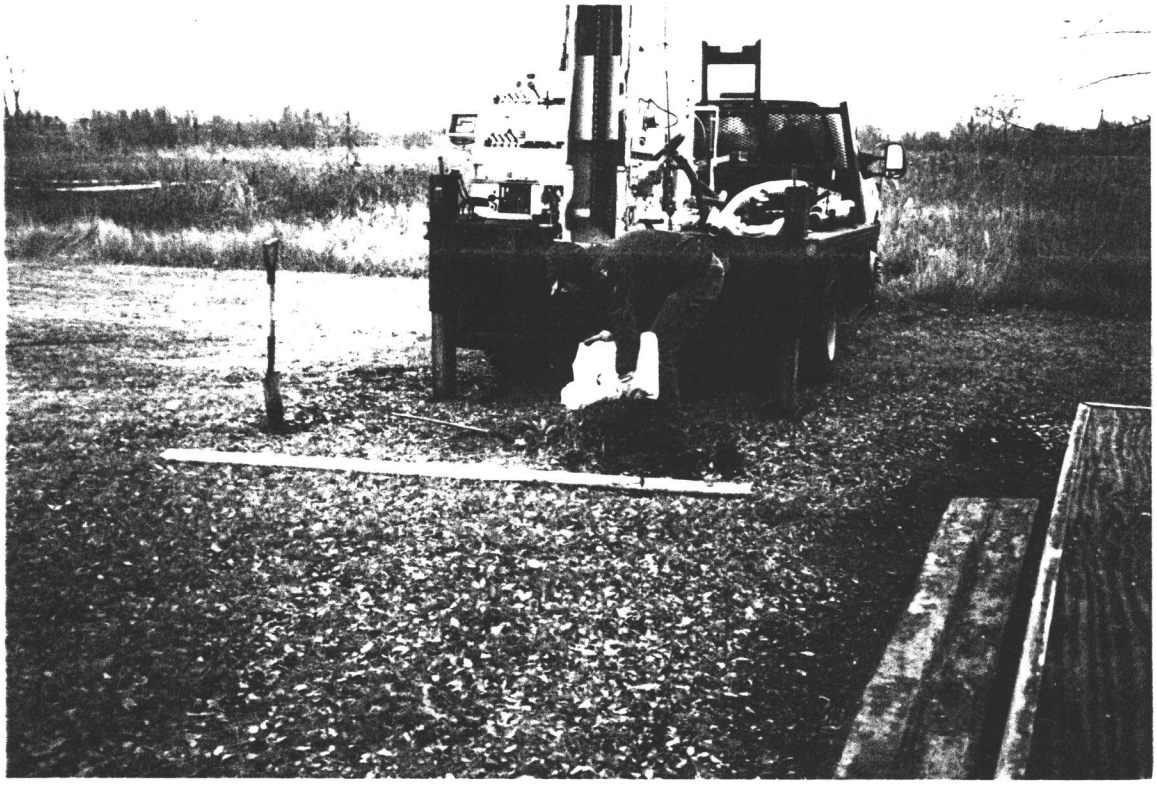
Excavation backfilled at B-2

Excavation backfilled at B-5

Excavation backfilled at B-4



Well closure TMW-3



Well closure TMW-1

Soil sample collection

Groundwater sampling using peristaltic pump.